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Child health and survival in urban slums in Malawi: healthcare seeking practices and relative significance of health system factors in influencing care seeking decisions among care givers of under-five children

Edgar Arnold Lungu

A Dissertation Submitted to the School of Medicine

Presented in Fulfilment of the Requirements for the Degree of Doctor of Philosophy in Health Systems Research

Trinity College Dublin

June 2014

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SUMMARY

Introduction: Despite significant improvements in child health indicators over the past few decades globally and in Malawi, various challenges remain. Globally, cost effective interventions to promote child health exist but coverage for some of them remains low, thereby affecting optimal attainment of child health and survival benefits from these interventions. In addition, the increasing urbanisation and urbanisation of poverty in sub-Sahara Africa including Malawi is manifesting in an increasing population living under slum conditions which pose significant health challenges for vulnerable population groups such as under-five children. Understanding demand and supply side determinants of access to under-five child health services in urban slum settings therefore presents one of the essential public health considerations of the modern time. This PhD thesis explored factors that influence care seeking for under-five health services among care givers in urban slums in Lilongwe, Malawi.

Objectives: Specific objectives included, to: (i) determine care givers response to childhood illnesses; (ii) identify factors that influence decisions to seek health care outside the home for common childhood illnesses; (iii) determine treatment actions focussing on significance of health care providers; (iv) assess knowledge of child danger signs; (v) explore child care practices among care givers and their implications for child health; (vi) determine the relative significance of health system factors in health care seeking decision making.

Methods: A mixed methods design that employed: (i) a longitudinal cohort study involving 543 care givers and their under-five children who were followed for one year to explore child morbidity and care seeking practices; (ii) a qualitative study that employed eight Focus Group Discussions and 10 Key Informant Interviews; and (iii) a Discrete Choice Experiment involving 338 care givers. The research was conducted in Senti, Mgona and Ntandire slums in Lilongwe.

Statistical Analysis: Generalised linear mixed models are used to analyse longitudinal data using R while baseline data is analysed using SPSS. Content analysis is used to analyse qualitative data using a coding frame. Random effects logit regression models, Willingness To Pay (WTP) and Willingness To Wait (WTW) estimates are used to analyse DCE data in STATA.

Key Findings: There is a significant burden of childhood morbidity in urban slums with a significant majority (>80%) of care givers reporting childhood illnesses at each of the three data collection points. Factors that positively influenced care seeking included care giver's

secondary education (OR 1.53 95%CI 1.04-2.25); more severe illness (OR 2.91 95%CI 1.96-4.21) and having fever (OR 2.71 95%CI 2.00-3.68) whereas older age of children (OR 0.35 95%CI 0.35-0.80); slum residence in Mgona (OR 0.62 95%CI 0.41-0.95) and Ntandire (OR 0.47 95%CI 0.31-0.73); and home management of illness (OR 0.38 95%CI 0.28-0.50) were negatively associated with care seeking. Slum residence in Ntandire (OR 0.54 95%CI 0.34-0.86); home management of illness (OR 0.36 95%CI 0.25-0.50); and knowledge of child danger signs (OR 0.52 95%CI 0.35-0.76) were negatively associated with timely care seeking. Knowledge of child danger signs was positively influenced by care giver's high autonomy (OR 5.74 95%CI 3.49-9.45), and high social capital (OR 2.44 95%CI 1.53-3.88) while slum residence in Ntandire (OR 0.50 95%CI 0.28-0.089) had a negative influence. Temporal changes were noted with regard to care seeking and timely care seeking.

Qualitative results noted: limited focus of child health programming in urban slums; harmful child care practices; health system barriers to accessing under-five child health services such as lack of medicines, negative attitudes of health workers, and long waiting times. Valuations from the DCE indicated that availability of medicines and supplies is the most important health system attribute (β 1.43) to care givers. This is followed, in their order of importance, by: thorough examination of the child (β 0.65); attitude of health workers (β 0.61); waiting time (β-0.30); and cost of health care (β-0.0004). The WTP and WTW estimates also demonstrate this pattern of relative importance of health system attributes.

There is convergence of findings from respective study designs especially with regard to influence and importance of health system determinants of care seeking. However divergent findings have similarly been noted.

Conclusion: In the context of increasing urbanisation and consequent slum formation, it is imperative that Malawi responds to health challenges of under-five children in urban slums. There is need to focus on household and health system factors to promote uptake of preventive and curative interventions in order to improve child health and survival in urban slums. Targeted strategies such as; understanding the epidemiological profile of under-five children; disaggregating data to transcend rural-urban comparisons; strengthening urban health systems; inter-sectoral efforts that address social determinants of child health, represent some of the crucial factors in promoting health and survival of under-five children in urban slums in Malawi.

DEDICATION

To my wife Khumbo and my son Uchizi whose invaluable support I cherish. My parents Mr and Mrs Lungu for their sacrifices and for instilling in me the value of education. My sisters Angella, Leonia and Deliwe and my brother Emmanuel who are always a source of inspiration as I try to be exemplary.

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LIST OF ABBREVIATIONS

ACSD	Accelerated Child Survival and Development
ARI	Acute Respiratory Infection
ART	Anti-Retroviral Therapy
CBCC	Community Based Childcare Centre
CHAM	Christian Health Association of Malawi
CHERG	Child Health Epidemiology Reference Group
CIMCI	Community Integrated Management of Childhood Illnesses
CSD	Child Survival and Development
CSDH	Commission on Social Determinants of Health
CVM	Contingent Valuation Method
DCE	Discrete Choice Experiment
DHO	District Health Office
ECD	Early Childhood Development
EHP	Essential Health Package
EHRP	Emergency Human Resource Programme
EPI	Expanded Programme of Immunisation
ESAR	East and Southern Africa Region
ETAT	Emergency Triage Assessment and Treatment
GDP	Growth Domestic Product
GOM	Government Of Malawi
HDI	Human Development Index
HSKN	Health Systems Knowledge Network
IHS	Integrated Household Survey
IMCI	Integrated Management of Childhood Illnesses
IMR	Infant Mortality Rate
IRS	Indoor Residual Spraying

ITN	Insecticide Treated Nets
KNUS	Knowledge Network on Urban Settings
LLITN	Long Lasting Insecticide Treated Nets
MDG	Millennium Development Goals
MDHS	Malawi Demographic and Health Survey
MGDS	Malawi Growth and Development Strategy
MICS	Multiple Indicator Cluster Survey
MOH	Ministry Of Health
NHA	National Health Accounts
NHSRC	National Health Sciences Research Committee
NMR	Neonatal Mortality Rate
NSO	National Statistical Office
PCV	Pneumococcal Conjugate Vaccine
PMTCT	Prevention of Mother To Child Transmission of HIV
RNI	Rate of Natural Increase
SWAp	Sector Wide Approach
THE	Total Health Expenditure
TWG	Technical Working Group
UNDP	United Nations Development Programme
UN-HABITAT	United Nations Human Settlements Programme
UNICEF	United Nations Children Fund
VHC	Village Health Committee
WHO	World Health Organisation
WMS	Welfare Monitoring Survey
WTP	Willingness To Pay
WTW	Willingness To Wait

CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Background of the study

Global trends pertaining to child health show a significant decline in child morbidity and mortality over the past few decades reflecting successes in various public health efforts (Claeson and Waldman, 2000, Bryce et al., 2006). Remarkably these gains have occurred in the context of other public health challenges such as antibiotics resistance and adverse effects of HIV and AIDS especially in developing countries (Claeson and Waldman, 2000). Nonetheless, it is widely recognised that improvements in child health have been unevenly distributed within and across countries (Schellenberg et al., 2003, Kristiansson et al., 2009). Rural-urban, rich-poor differentials in child health indicators are cases in point for within country differentials. For example, in Malawi, child stunting rates are 48% for the rural compared to 41% for urban and use of Insecticide Treated Nets is at 71% for rural compared to 86% for urban children (NSO and ICF-Macro, 2011).

Justifiably, ensuring that health services reach the rural populations has been one of the policy priorities of Malawi's Ministry of Health (GOM, 2006). While policy focus and information on rural-urban comparisons pertaining to health indicators has been useful, evidence has so far accumulated signalling wider intra-urban health inequities (Haddad et al., 1999, Montgomery and Hewett, 2005, Zere and McIntyre, 2003). This phenomenon further suggests that certain population groups within the urban setting, such as the urban poor living in slums experience a health disadvantage (Harpham and Molyneux, 2001, Van de Poel et al., 2007). An analysis of Demographic and Health Surveys data from African countries by Garenne (2003) found a declining trend in rural-urban differentials in child mortality due to slower decline in child mortality in urban relative to rural settings. Some authors have since argued that this is resulting from a phenomenon where some population groups in the urban setting, such as the urban poor living in slums have worse health state than the urban average, or even their rural counterparts, hence reducing the urban advantage (Islam and Azad, 2008, Garenne, 2010, Fotso, 2006, APHRC, 2002).

It is estimated that the urban population will grow to 60% by 2030 with developing countries urbanising at a very fast rate (UNDP, 2008, Garenne, 2010). While Malawi is classified as the least urbanised country in Africa, its rate of urbanisation of 6.4% is three times the world's rate and almost two times the Africa rate of 3.5% (UN-HABITAT, 2010). It is recognised that in many developing countries especially in sub-Sahara Africa, the increasing urbanisation has occurred in the context of dismal economic growth or in some cases reduction in Gross Domestic Product (GDP) (Fotso, 2006). Consequently, increasing urbanisation rate has been associated with high urban poverty levels manifested by increasing slums (UN-HABITAT, 2010).

While only about 17.3% and 4.3% of urban residents in Malawi are said to be poor and ultra-poor respectively (NSO, 2012), a significant proportion of the urban population lives in slum conditions which constitute: insecurity of tenure; poor housing conditions; poor access to safe drinking water and sanitation; and overcrowding in households (UN-HABITAT, 2010). A slum incidence mapping by the UN-HABITAT placed Malawi in the category of countries with the highest proportion of households living under slum conditions (UN-HABITAT, 2003). Recent estimates indicate that 61% of the urban population is reportedly living in slum conditions (UN-HABITAT, 2010). This presents a context within which the health, especially of vulnerable population groups such as children under the age of five years (henceforth under-five children) in these conditions, should be a concern for health policy and practice with regard to countering factors responsible for child morbidity and mortality.

It is commonly consented to that proven cost effective child health interventions are available and that with adequate access, a significant number of child deaths can be avoided (Jones et al., 2003) ultimately improving child health and survival. Conversely, inadequate and/or delay in care seeking for childhood illnesses has been documented as a critical factor contributing to child mortality in developing countries (Kamat, 2006, Bojalil et al., 2007). For example, a child deaths social autopsy study in Mexico attributed 32% of deaths to late care-seeking alone (Bojalil et al., 2007). Factors such as non-recognition of symptoms and their severity; distance to health facility, cost of health care, limited care givers autonomy, and low confidence in the health system have been cited as determinants of delay or inadequate care seeking (Kamat, 2006, Bojalil et al., 2007).

With regard to the urban population, it would be anticipated that due to proximity to multiple health facilities, care givers would seek appropriate and timely care for childhood illnesses. Nonetheless, as Rutherford et al. (2010) assert, factors such as social support, care giver's autonomy and time availability should be considered additional determinants of care-seeking to the conventional distance to health facility and health costs. Evidently, a study by Kristiansson et al. (2009) in an urban setting in Peru found that inequity and limited access to health services for children aged 6-72 months prevailed to the disadvantage of the poorest households despite geographical access to health facilities and free services at point of delivery. Likewise, Shetty (2011) posits that health care for the urban poor, including those residing in slums, falls through the gap as they may not have access to high quality care in the urban due to cost constraints but also do not have access to health care programmes by the Government and Non-Governmental Organisations (NGO) as the rural population do.

On the other hand, some authors have observed that in most developing countries, health and other social services have not kept pace with the rate of urban population growth (Matthews et al., 2010) further suggesting inadequacy in the supply side of health services. Consideration of urban population dynamics and organisation of health services is therefore particularly crucial in promoting child health and survival in urban settings.

From the preceding assertions, it is essential to understand both the supply and demand factors promoting access to child health services. Precisely, it is essential to create a conducive household, community and health system environment to enable appropriate health care seeking. Factors such as friendly staff at health facilities, availability of medicines and supplies, and thorough examination, have been cited as crucial health care system factors influencing demand and provider preference for health services (Bassett et al., 1997, Brugha and Zwi, 1998). However information is sparse on the relative importance of various healthcare system factors, in so far as they influence care givers decision to seek healthcare. Arguably this approach is essential to achieve responsiveness to people's expectations and improve access to health services by vulnerable populations; - two key health system pursuits (WHO, 2007). Moreover, the decision making dynamics may interact in a complex way for a poor household residing in a slum in an urban context that is usually cash dependent (Shetty, 2011).

Consequent to the above, this study seeks to explore health seeking behaviour of care givers in urban slums in Malawi including the relative importance of health system determinants of care seeking for child health services. Cognisant of the broad nature of child health, this PhD research will focus on three childhood illness symptoms namely: fever, diarrhoea and Acute Respiratory Infection (ARI) which constitute three commonest childhood illnesses in Malawi (GOM, 2006).

1.1.1 Problem Statement

As much as 50% of child deaths in Malawi occur in the community, some without contact with a health facility (GOM, 2006), reflecting poor health care seeking behaviours ultimately affecting child health and survival. However, this represents aggregate levels which mask differentials among populations. Disaggregated and/or specific information pertaining to some vulnerable urban populations is presently lacking. Garenne (2003) rightly observes that large demographic and health surveys hardly focus on the urban poor and slum areas hence not providing information on a significant aspect of urban health. In the context of Malawi being one of the fastest urbanising countries, with an increasing population residing in slum conditions, this presents a crucial public health issue warranting attention.

Many previous studies elsewhere and in Malawi have focussed on rural-urban comparisons in terms of childhood disease burden and access to health care, and have exclusively signalled an urban advantage (Harpham and Molyneux, 2001, Chuma et al., 2007, Islam and Azad, 2008). While providing invaluable information for child health programming, this approach falls short of documenting the health disadvantage of vulnerable urban population groups. It also does not consider ongoing changes in the urban environment which may be crucial determinants of child health and access to child health care in particular.

Additionally, while many studies have provided useful information on health system factors influencing health service use, there is paucity of information with regard to the relative significance of these factors to vulnerable urban population groups especially for child health services. This represents a knowledge gap in Malawi.

1.1.2 Research Questions

The following are research questions for this PhD research:

i. What is the prevalence of fever, diarrhoea and ARI among under-five year old children in the urban slum population in Malawi?
ii. How are health services organised within the urban slum setting in Malawi?
iii. What are the health care seeking practices for childhood illnesses among urban slum populations in Malawi? (Timely care-seeking? preferred health service providers? provider switching?), and what factors determine this care seeking behaviour?
iv. Are there temporal changes in response to childhood illness episodes (care seeking and timeliness in care seeking) and knowledge of child danger signs?
v. Does frequency of contact with a health facility improve knowledge of danger signs for childhood illnesses?
vi. What is the relative significance of different health system factors in influencing urban slum care givers' decisions to utilise under-five child health services?

1.1.3 Hypotheses

This PhD research hypothesises as follows:

i. Under five children in the slum setting will exhibit high morbidity of fever, diarrhoea and ARI symptoms in that order of prevalence.
ii. Delivery of under-five child health services is standardised in spite of context specific health needs of under-five children resident in urban slums.
iii. Despite geographical access to health services, the majority of care givers will manifest inappropriate health care seeking behaviours such as not seeking health care from biomedical health providers where required, and late care seeking.
iv. There will be temporal changes in response to childhood illness episodes over time
v. Knowledge of child danger signs improve as care givers interact with the health system.
vi. Health system factors that signal quality of health care are the most significant in influencing health facility use and/or choice of a health provider.

1.1.4 Significance of the Study

Current health policy content in Malawi generally assert the need for health services in reaching the rural poor (GOM, 2006) implicitly suggesting that the entire urban population is better off. As argued earlier, emerging evidence portrays health disadvantage of some urban populations. In the context of high urbanisation rate in Malawi, it is a policy imperative to promote the health of children of vulnerable urban populations. This study will provide evidence for child health in this regard, generating policy awareness and an impetus to tackle crucial urban health issues to prevent greater child health problems as the urban population grows. In essence the study recognises the need to tackle the problem at present and has a futuristic view of the problem especially if the existent and emerging challenges are not well planned for. As Martine argues in Shetty (2011), *"advanced planning will be cheaper and easier than dealing with the situation in a few decades time" (p 2)* as failure to plan properly can be catastrophic.

Moreover, it is recognised that without significant service uptake, it is impossible to reduce morbidity and mortality levels to the extent promised by cost effective interventions (Pokhrel, 2006). Exploring health care seeking practices considering household and health system factors as is the case herein, represents a worthwhile focus as it seeks to understand aspects of both supply and demand sides. This view ultimately has potential to contribute to effective child health programming in urban slums to increase health service uptake and promote child health and survival.

Some previous studies on health care seeking practices in Malawi and elsewhere (Amarasiri de Silva et al., 2001, Chuma et al., 2007, GOM, 2004b, Munthali et al., 2005) have mostly used cross-sectional or qualitative designs. While these have provided invaluable information, they have had limitations of capturing responses to single illness episodes and not observing temporal decision making dynamics. This PhD research included a longitudinal design and was therefore useful in documenting health care seeking responses to multiple episodes of childhood illness in the household. Precisely its distinct advantages pertain to its potential in observing temporal changes but also achieving more reliable findings resulting from capturing multiple observations.

With focus on common childhood illnesses, the study will contribute to efforts for Malawi to attain Millennium Development Goal (MDG) number 4 (reducing child mortality by two thirds by 2015 from 1990 levels). Arguably, child health indicators will show dismal improvements if the health of children in disadvantaged settings stagnates or improves dismally. To improve aggregate indicators also entails tremendous efforts among the worse-off groups. It is widely agreed that attainment of MDGs should have equity considerations for improvements to be sustainable and in respect of the right to health for all individuals (Zere et al., 2007b). This PhD research is essential as it pursues the health equity sensitive approach which is in line with guiding principles of the Malawi Ministry of Health (GOM, 2008, GOM, 1999, GOM, 2011b, GOM, 2004c), the national health research agenda for Malawi (GOM, 2012b) and global health goals (WHO, 2007).

1.1.5 Aim of the PhD research

To investigate caregivers' health seeking behaviour including the relative significance of health system determinants of care seeking for three common childhood illness symptoms and document their implications for child health and survival in urban slums of Malawi.

1.1.6 Specific objectives of the PhD research

1 To determine care givers response to childhood illnesses in urban slums.

2 To identify factors that influence decisions to seek health care outside the home for common childhood illnesses among care givers in urban slums.

3 To determine treatment actions focussing on significance of various health care providers (public and private health facilities, drug vendors, and traditional healers) among care givers in urban slums.

4 To assess knowledge of danger signs in relation to childhood illnesses among care givers in urban slums.

5 To explore child care practices among care givers in urban slums and their implications for child health.

6 To determine the relative significance of health system factors in health care seeking decision making.

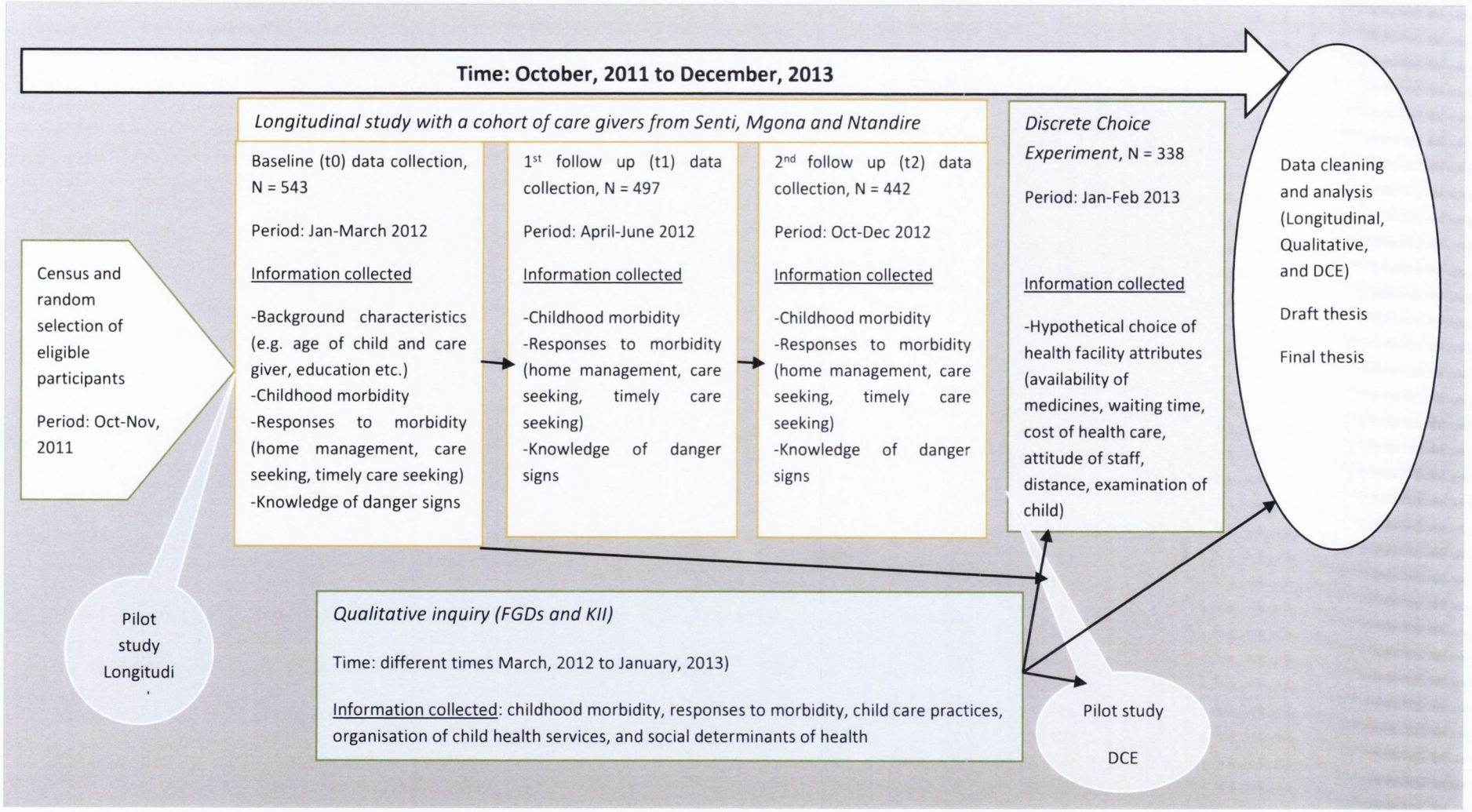
1.2 Design of the PhD research

In order to achieve its objectives, this PhD research uses a mixed methods approach, utilising quantitative and qualitative methods. It has three distinct but complementary study designs namely: observational prospective cohort; qualitative; and Discrete Choice Experiment (DCE). A mixed methods approach was chosen because of its potential to provide a holistic picture of the phenomenon than would have been the case using a single method approach. Besides comprehensiveness of findings, a mixed methods approach is used to allow for complementarity at design stage in that one method informs steps of another method (Pluye et al., 2009). For example, qualitative study findings inform attributes for design of a DCE study.

Literature on mixed methods research posits that qualitative and quantitative methods should no longer be viewed as being founded on two opposing philosophical paradigms, rather that the two can be combined to reap the benefits of both. The justifications of using mixed methods research have thus been cited, that they: afford comprehensiveness in understanding phenomenon of interest; are useful in understanding complex interventions and services such as in health; increase confidence in findings; and afford opportunity for one method to inform steps of another study design (O'Cathain et al., 2007, Pluye et al., 2009).

For purposes of clarity and logical sequence; methodological considerations, results, discussion, and strengths and limitations for each of the three study designs will be presented in separate chapters in the following order: observational prospective cohort study (chapter 5); qualitative study (chapter 6); and DCE study (chapter 7). However some key steps in conducting all the three study designs of this PhD research is presented in a PhD research study schematic presentation to provide an overview at this stage.

Figure 1.1: PhD research study schematic illustrating time and flow of conducting the three study designs



1.3 Choice and description of the study setting: an overview of the socio-demographic and health profile of Lilongwe

1.3.1 Choosing setting for the study

The study was conducted in three randomly selected urban slums in Lilongwe. Lilongwe was selected because it is the capital city and is the fastest urbanising of Malawian cities (UN-HABITAT, 2010). The selection of the study areas involved two steps. Firstly, based on the urban slum definition of UN-HABITAT (briefly described earlier in section 1.1 and in detail in section 3.3.2), urban slum areas were identified. Further consultation with key informants from the local UN-HABITAT and City Assembly were done to validate the selected areas in light of the urban slum definition. Secondly, a simple random selection was used that involved the following steps: names of all potential study areas were written on pieces of paper; the pieces of paper were concealed and placed in a hat; and finally three pieces of paper were picked from a hat. These areas include: Senti, Mgona and Ntandire.

Disaggregated information to comprehensively capture health and social indicators in different areas, such as slum settings within Lilongwe city is currently unavailable. For this reason a descriptive overview of health and some socio-demographic indicators are presented for the whole Lilongwe as an overall context of the study.

1.3.2 An overview of socio-demographic and health profile of Lilongwe

Lilongwe is located in the central region and is the capital city of Malawi. It was declared a capital city in 1975 and since then, there has been rapid urbanisation associated with social and economic development (GOM, 2010). Its total population in the 2008 Population and Housing Census was estimated to be 674,448 (NSO, 2009). With an annual population growth rate of 4.3%, Lilongwe's population is estimated to reach 1,077,116 by 2015 and 1,324,314 by 2020, effectively doubling within slightly more than a decade (12 years).

According to the Lilongwe urban profile (GOM, 2010), 76% of the city population lives in informal settlements which cover 12.2% of total city land area (GOM, 2010). The population in informal settlements continues to grow and estimates in 2005 indicated a growth rate of 8.2% which was double the overall population growth rate for Lilongwe (GOM, 2010). Contextual factors such as inadequate access to safe water, sanitation, durable housing,

insecurity of tenure, and environmental contamination are characteristic of the informal settlements in Lilongwe (UN-HABITAT, 2011).

The health system context of Lilongwe is similar to the national context provided in the subsequent sections (refer to 2.4). It is served by four major hospitals (one central/referral hospital; one public secondary level hospital; two secondary level facilities under the CHAM) and about 33 public and private health facilities offering primary level care.

Malaria is the commonest cause of morbidity and mortality in Lilongwe. Evidently, 206,830 cases of malaria were reported in 2008 with a greater burden in the informal settlements and among children under the age of five years. As per 2008 estimates of facility reported malaria cases, 52% were among children under the age of five (GOM, 2010). Other child health indicators show a similar picture of high burden of disease and poor health outcomes. Table 1.1 below presents selected child health indicators for Lilongwe as reported by the Multiple Indicator Cluster Survey (MICS) – a nationally representative survey with indicators disaggregated at district level. National level indicators are also provided to provide comparison with the broader context.

Table 1.1: Selected child health indicators in Lilongwe and Malawi

Child health indicator	National	Lilongwe
Neonatal mortality rate (*per 1000 live births*)	37	49
Infant mortality rate (*per 1000 live births*)	81	93
Under-five mortality rate (*per 1000 live births*)	140	166
Child stunting rate (%)	46	46.1
Underweight children (low weight for age) (%)	20.5	24
Fully immunized children (%)	70.4	65
Diarrhoea prevalence (%)	24.1	26.4
Prevalence of suspected pneumonia (%)	29.5	29.4
Child slept under ITN (%)	24.7	27.2
Prevalence of fever (%)	34.7	36.1

Note: all indicators denoting prevalence were based on presence of a childhood illness episode two weeks preceding the date of interview

Source: NSO and UNICEF (2007)

As table 1.1 above indicates, most of the child health indicators in Lilongwe are worse than national averages, reflecting high burden of childhood morbidity and mortality. Moreover, in some child health outcome indicators such as infant and child mortality, Lilongwe ranks among the top five worst affected districts (NSO and UNICEF, 2007).

Despite the paucity of comprehensive disaggregated information, an urban profiling exercise was conducted in Lilongwe and involved specific settings including Senti, Mgona and Ntandire (CCODE and MHPF, 2011, CCODE and MHPF, 2012, CCODE and MHPF, 2011). This provided some specific information about the areas which is presented in Table 1.2. Population figures for respective settings provided in table 1.2 are from the population and housing census but may underestimate current population figures. This may be due to some differences in geographical boundaries as applied by the national census and as defined by the locals. For example, a census conducted in Mgona by an NGO estimated a population of about 50,000 (CCODE and MHPF, 2011) while those from national census indicate 26 900. The lack of reliable population estimates in this context should therefore be noted.

Table 1.2: Socio-demographic and infrastructure profile of Senti, Mgona and Ntandire

Characteristic	Senti	Mgona	Ntandire
Population	13583[a]	26900[a]	36642[a]
Geographical position	West of Lilongwe city and 3 km from city centre	North west of Lilongwe city and 15 km from city centre	North west of Lilongwe city and 6 km from city centre
Health facility	None within Senti but nearest public health centre is 2.5 km away	None within Mgona but nearest public health centre is 2 km away	One private health facility within. Nearest public health facility is 4km away
Common illnesses	Malaria, Tuberculosis, HIV/AIDS, occasional cholera outbreaks, cancer	Malaria, general coughs, Sexually Transmitted Infections, diarrhoea	Malaria, general coughs, Sexually Transmitted Infections, diarrhoea
Water source	Mostly public water kiosks. They pay K5 per 20 litres bucket. Also use river and wells	Mostly public water kiosks. They pay K6 per 20 litres bucket. Also use river and boreholes	Mostly public water kiosks. They pay K3 per 20 litres bucket. Also use river, wells and boreholes
Sanitation	Basic pit latrines	Basic pit latrines	Pit latrines and few ecological sanitation
Waste disposal	No designated waste disposal site. Most people dump waste anyhow	No designated waste disposal site. Some use rubbish pits that they dig. Others dispose of waste in river.	No designated waste disposal site. Use rubbish pits. Bio waste is collected for manure by a voluntary group on a small scale

Note: Information in table above was generated by an NGO (CCODE) with the involvement of communities.
[a]Population figures may be underestimated as described above
Sources: CCODE (2012); CCODE (2013); CCODE (2011)

1.4 Scope of the study

This PhD research study used: (i) a cohort sample of 543 care givers at baseline who were followed for a period of 12 months with data collected three times at three to four months intervals, and finishing with 442 care givers by the final (second) follow up; (ii) 89 care givers in Focus Group Discussions (FDG) and 10 key informants for qualitative inquiry; and (iii) 338 care givers in the DCE study who were a subset of the 442 cohort of care givers at the second follow up of the longitudinal study. More details are presented in chapters 5, 6 and 7.

1.5 Research contribution to knowledge

The contribution of this PhD research to current knowledge is threefold. Firstly, it will provide in-depth understanding of the health (including determinants of access to health services) of under five children in a slum setting, an area which is often paid little attention in health research and practice.

Secondly, it contributes to understanding of the urban slum environment in Malawi including the sociocultural child care practices and their implications on health of children under-five years of age.

Thirdly, it contributes to deeper understanding of valuations of health system factors in accessing health services for under five children in an urban slum setting using Discrete Choice Experiments (DCE) which have not yet been extensively utilised in sub-Sahara Africa, let alone in slum settings. To the PhD researcher's knowledge, it is the first DCE study applied in health services in slums and in Malawi in general.

1.6 Ethical approval

This PhD research was approved by the National Health Sciences Research Committee in Malawi (NHSRC) under approval number NHSRC 895 and Trinity College Dublin's Centre for Global Health/Health Policy and Management Research and Ethics Committee (CGH/HPM-REC). The ethical approval notification letters are attached as Appendices I and II for the NHSRC and CGH/HPM-REC respectively.

Furthermore, institutional clearance was granted by the Lilongwe City Council as the study setting is within their jurisdiction. Participation in all study components of this PhD research was on voluntary basis and informed consent was sought from study participants. Depending

on literacy levels, potential participants were either provided with a Participant Information Leaflet about the study (Appendix III) to read or its content was read out and explained to them. If they agreed to participate, participants provided written consent by signing or in cases of illiterate participants, finger printing (smearing finger with ink and pressing) the consent form (refer to Appendix IV). Some participants who were uncomfortable with finger printing provided verbal consent. Specific details pertaining to number of participants who consented at each of the three data collection points for the longitudinal study are provided in section 5.2.5 and figure 5.1; for the qualitative and DCE designs, numbers of consenting participants are provided in sections 6.2.3 and 7.2.3 respectively.

Data protection was ensured through the following: participants coding in which each study participant was assigned a numeric code which was a unique identifier used at all stages of respective study designs; encryption of electronic data including using password protection for computers in which participant information was stored; and storage of paper based data in locked cabins and keys were only accessible to the primary researcher. In addition, pseudonyms were used for qualitative study participants to conceal identity when reporting.

1.7 Organisation of the PhD thesis

This PhD thesis is presented in the chronological order of chapters as outlined below:

Chapter 1 is the current chapter. It introduces the PhD research, specifically outlining the background information including the problem statement that necessitated the PhD research; the research questions; hypotheses; significance of the PhD research; aim and objectives; overall design of the PhD research; brief description of Lilongwe as the overall study setting; scope of the PhD research; contribution of the PhD research to prevailing knowledge; ethical considerations; and finally outlines the structure of the PhD thesis.

Chapter 2 introduces the country context. The chapter begins by providing the state of child health in Malawi through a description of the epidemiological profile and the organisation and performance of the child health subsystem. This is followed by a brief description of the Malawi health system within which the child health subsystem is embedded. The World Health Organisation's six building blocks framework is used to describe the Malawi health system context.

Chapter 3 documents a review of literature. Literature discourse in thematic areas of urban health, urbanisation and its health impacts; global child health epidemiology and access to child health interventions; and determinants of use of child health services, is presented.

Chapter 4 describes the conceptual framework of the study. This thesis uses Andersen's health utilisation model. An outline of frameworks of potential relevance for this PhD research is presented followed by description of the conceptual basis of Andersen's framework; and its application to this PhD research.

Chapter 5 presents the longitudinal study of the PhD research. The design; methods and findings pertaining to: childhood morbidity, health care seeking from a health provider in the event of childhood illness, timeliness in care seeking, and knowledge of child danger signs are presented at baseline and over follow up time period. This is followed by discussion of findings; and strength and limitations of the longitudinal study design.

Chapter 6 presents the qualitative study design. Presentation in this chapter follows the following order: methodological arrangements; findings on: health system determinants of care seeking and provider preference, child care practices with health implications, organisation of child health services, and social determinants of child health; discussion of findings; conclusions drawn; and strengths and limitations of the current qualitative inquiry.

Chapter 7 is the Discrete Choice Experiment (DCE) chapter. It describes the design steps; findings pertaining to relative significance of health system factors in influencing care seeking decisions for under-five child health services; discusses findings; and reflects on strengths and limitations of the DCE study design.

Chapter 8 is the integrated discussion chapter that synthesises key convergence and divergence of the findings from the three study designs. It also briefly draws on postulations of the Andersen health utilisation model and put the overall PhD research findings into context of the framework.

Chapter 9 is the final chapter which provides overarching conclusions of the PhD thesis and outlines recommendations for child health policy, practice, research, and draws areas for further research. This chapter also provides concluding thoughts based on overarching findings from the current study and literature review.

CHAPTER TWO

THE STATE OF CHILD HEALTH AND THE HEALTH SYSTEM IN MALAWI: A DESCRIPTIVE VIEW

2.1 Introduction

This chapter describes the state of child health in Malawi as the broader context of the study. Specifically the chapter describes key child health indicators, constituting both outcome and health service indicators; organisation of child health services including other health components such as child health financing, governance and human resources. A brief description of the Malawi health system in general is also presented using the World Health Organisations (WHO) Health Systems Building blocks framework so as to provide the wider health system context within which child health subsystem is embedded. In order to appreciate the macro environment which ultimately influences the health system in general and child health in particular, this chapter begins with an overview of demographic and socioeconomic profile of Malawi.

2.2 An overview of Malawi's socioeconomic profile, key health indicators and the health system.

Malawi is a Sub-Saharan African country bordering Tanzania to the north and north east, Zambia to the west and northwest and Mozambique to the east, south and southwest. It covers a total area of approximately 118,484 square kilometres of which 94,276 square kilometres is land. Its per capita Gross Domestic Product (GDP) is estimated to be 313 USD (NSO, 2012).

The 2008 Population and Housing Census (PHC) estimated that Malawi's population in 2013 would be at 15.3 million with a population growth rate of 2.8% per annum (NSO, 2009). Malawi's population has almost doubled in less than three decades (GOM, 2011b) and the demographic pressure on the health system and other social sectors is evident. Malawi has a relatively large population in the younger age groups as 48% of its population is under the age of 15. Under five year old children account for 16.4% of the population (NSO, 2012). With a geographical population distribution of 85% and 15% in rural and urban areas respectively

(NSO, 2009), Malawi is predominantly a rural country. Nonetheless, at 4.8%, it has one of the highest urbanisation rates in the world (UN-HABITAT, 2010, Chome, 2007).

Malawi's socioeconomic indicators are characteristic of a low income country to an extent that using the United Nations Development Programme's (UNDP) Human Development Index (HDI), Malawi is ranked 170 of the 187 countries (UNDP, 2013). Evidently, 50% of the population lives below the national poverty line of MK101 (about 0.3 USD according to prevailing exchange rates) per capita per day and 25% are considered to be ultra-poor (meaning they cannot afford to meet the minimum standard for recommended daily food requirement) (NSO, 2012).

Adult literacy rate, which entails the ability to read and write in any of the languages, stands at 64%. Life expectancy at birth is among the lowest in the world at 50 years and has declined over the past few years due to the effects of HIV and AIDS among other reasons (GOM, 2011b). Dependency ratio stands at 1.2 (GOM, 2011b, NSO, 2012) implying that there are more economically inactive relative to the economically productive persons in Malawi. This socioeconomic and demographic profile is not surprisingly reflected in health indicators cognizant that they are key social determinants of health.

Despite improvements in recent years, Malawi's health indicators remain poor. With an HIV prevalence rate among 15 – 49 year old adults at 10.6% (NSO and ICF-Macro, 2011), Malawi is one of the countries worst affected by the pandemic. Maternal Mortality Ratio (MMR) is also high at 675 deaths per 100 000 live births). Household knowledge about health and disease prevention is generally high, but utilization remains low for many key health interventions (Manafa et al., 2009). Selected health indicators as these have a bearing on child health and survival and represent the context for response from policy to service provision levels.

2.3 The state of child health in Malawi: child health indicators and organisation of child health services.

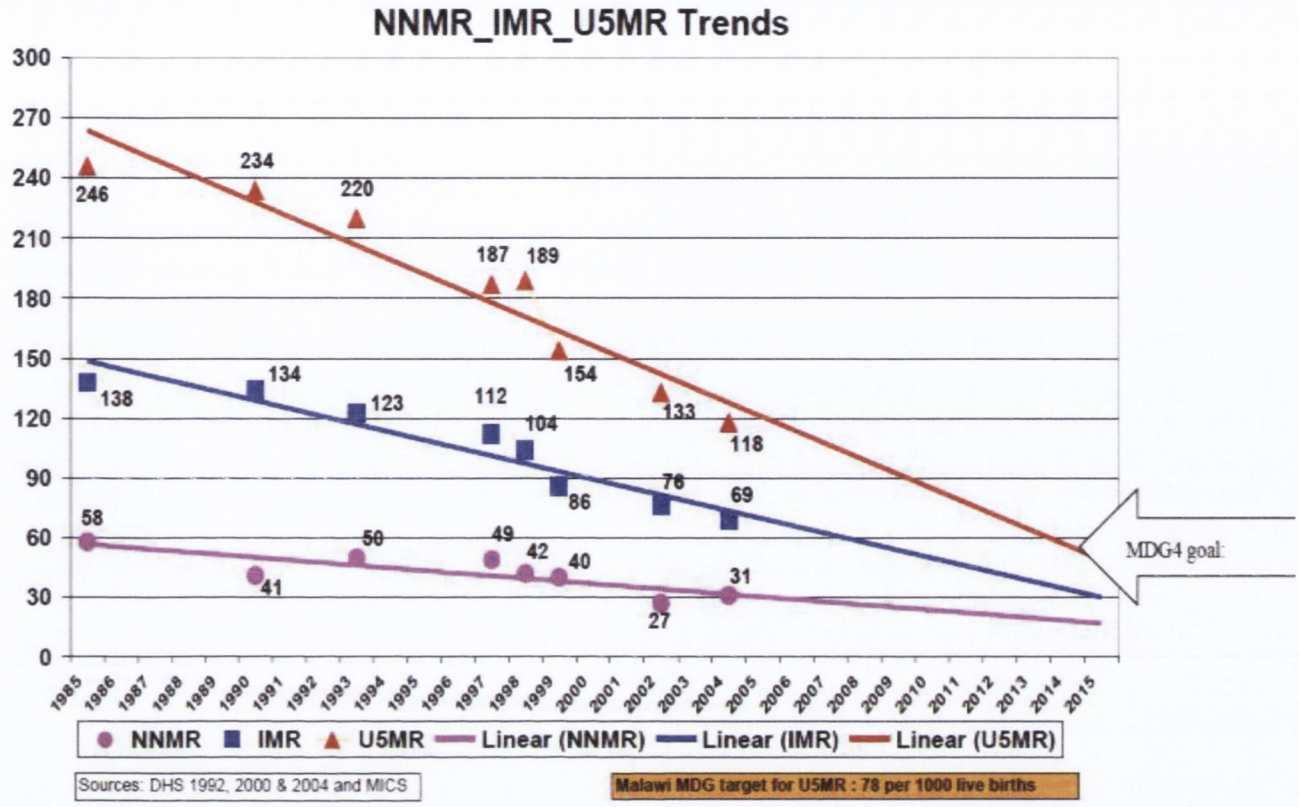
2.3.1 Child health status and service indicators in Malawi

Over the past few decades, Malawi has made significant strides pertaining to reduction in child morbidity and mortality levels to the extent that many child health indicators show an improving trend. Moreover, recent reports in tracking progress towards attainment of

Millennium Development Goals (MDGs) indicate that Malawi is on track, and if current trends continue, may even surpass the MDG 4 target (GOM, 2009a, GOM, 2013a). The MDG 4 aspires to 'reduce by two-thirds, between 1990 and 2015, the under-five mortality rate' (Pearson, 2009). For Malawi, the MDG 4 target entails an under five mortality rate of 78 per 1000 live births (GOM, 2013a).

Nonetheless, it has been acknowledged that there have been marginal improvements in some key child health indicators and that the situation is still worrisome for child health. Besides, while achieving MDG 4 will have been indicative of good performance, it should be recognised that due to the very high child mortality rates at baseline, the level at which the target is attained (78 per 1000 live births) is still unacceptably high. Figures 2.1 and 2.2 below provide some selected key child health status indicators namely Neonatal Mortality Rate (NNMR), Infant Mortality Rate (IMR) and Under five Mortality Rate (U-5MR) over the years as provided by the Malawi Demographic and Health Surveys (MDHS) of 1992, 2000, 2004 and 2010 and the Multiple Indicator Cluster Survey (MICS) of 2006. The surveys use a similar methodology and nationally representative sample sizes hence the results are largely comparable across indicators.

Figure 2.1: Neonatal Mortality Rate (NNMR), Infant Mortality Rate (IMR) and Under 5 Mortality Rate (U5MR) trends from 1985 to 2004

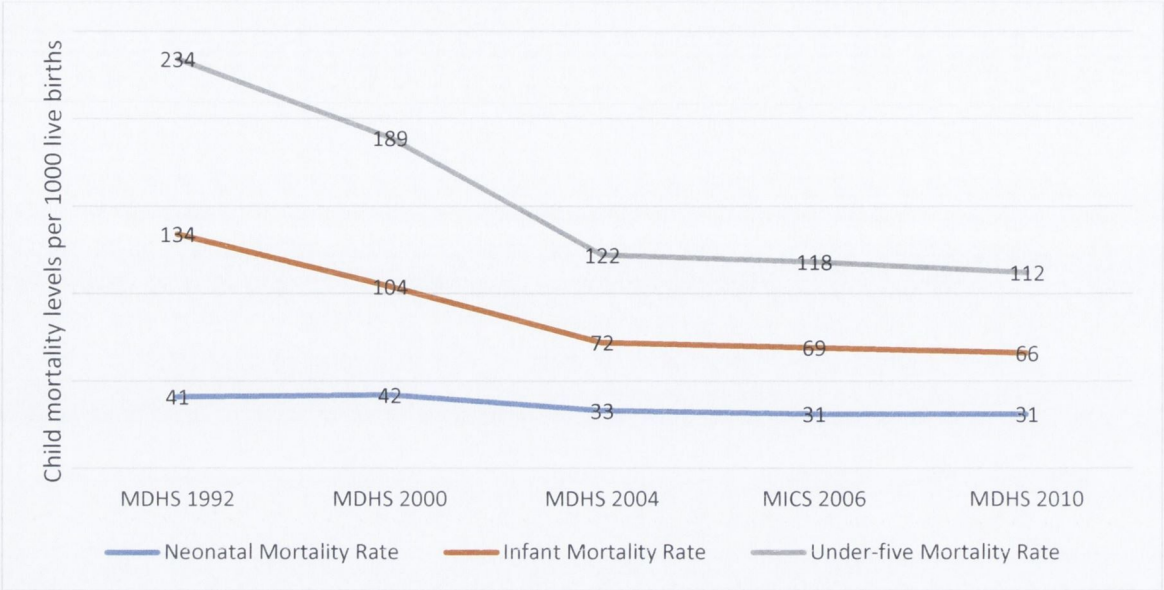


Source: GOM (2009)

As figure 2.1 above illustrates, all four child health status indicators show a declining trend from the 1985 levels. As a linear projection entails, by 2015, under five child mortality rate is estimated to 60 deaths per 1000 live births surpassing the 78 deaths per 1000 live births MDG 4 target. A recent Malawi MDG progress report that includes findings from the 2010 Malawi Demographic and Health Survey estimates an under five mortality rate of 61 deaths per 1000 live births by 2015. Other MDG 4 progress indicators namely IMR and proportion of one year old children immunised against measles are estimated to slightly fall short of the 2015 MDG targets. To illustrate, it is estimated that by 2015 IMR will be 47 deaths per 1000 live births while the MDG 4 target is 45 and proportion of one year old children immunised against measles is estimated to be 97.3% against a target of 100%.

Figure 2.2 below demonstrates a similar trend including the findings from the recent Malawi Demographic and Health Survey of 2010.

Figure 2.2 Child mortality (U-5MR, IMR and NNMR) trends from 1992 to 2010



Source: Authors computation of aggregate data from MDHS 1992; 2000; 2004 and 2010 and MICS 2006.

As figure 2.2 above illustrates, there has been a significant decline in under five and Infant Mortality Rates from 1992 to 2010 with a more salient decline between 1992 to 2004. The significant declining rate in IMR and U5MR between 1992 and 2000 may be because of the longer time period between the two data points (8 years) in an already declining trend relative to other time periods of two (between 2004 and 2006) and four (2000 to 2004 and 2006 to 2010) years apart between other data points.

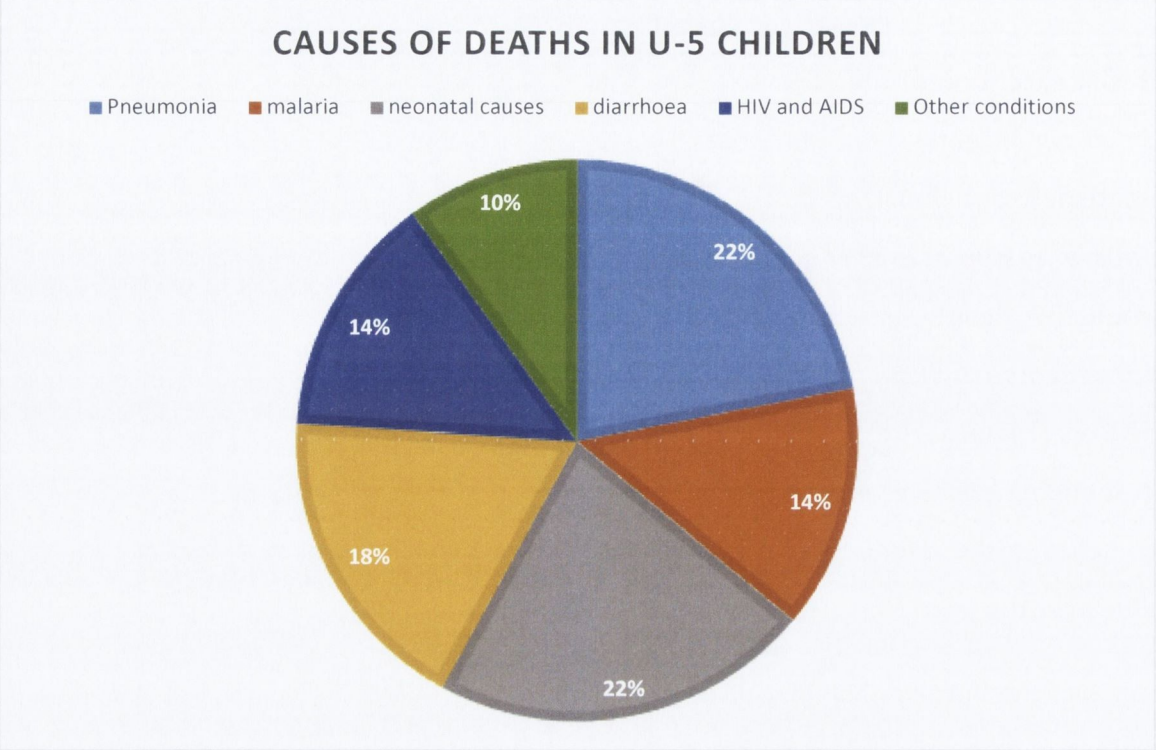
Nonetheless, among the reasons attributable to the general decline as indicated in figures 2.1 and 2.2 are: the implementation of an Integrated Management of Childhood Illnesses (IMCI) strategy towards the late 1990s and a successful Expanded Programme of Immunisation (EPI) which has achieved high immunisation rates over the years (GOM, 2008, NSO and ICF-Macro, 2011, NSO and ICF-Macro, 2005, NSO and ICF-Macro, 2001). Additionally, improvements in access to some social determinants of health over the years could be attributed to this declining trend in child mortality. For example, according to the Integrated Household Surveys (IHS), household access to an improved water source increased from 50% in 1998 to about 79% by 2011; adult literacy increased from 51% in 1998 to about 65% in 2011 and household

access to improved sanitation increased from about 62% in 2005 to 72% by 2011 (GOM, 2011b).

With the exception of the 2000 to 2004 period, Neonatal Mortality Rate (NNMR) has not declined significantly over the years. This effectively calls for a rethink of strategies to promote new-born health as it happens within the context of health policy and planning that prioritises maternal and new-born health as evidenced by increased investment in reproductive health services and policy content (GOM, 2011b, GOM, 2004d). Arguably, improvements in indicators closely associated with neonatal health such as skilled attendance at delivery, Maternal Mortality Ratio, antenatal attendance and birth weight should have a corresponding positive effect of reduction in NNMR. However, while improvements have been noted in these indicators (NSO and ICF-Macro, 2011), NNMR hardly show significant decline over the years.

In terms of the burden of childhood diseases, three disease conditions namely, pneumonia, malaria, and diarrhoea constitute the commonest single causes of childhood morbidity and mortality in Malawi (Bowie and Mwase, 2011, GOM, 2008). Data from the Global Burden of Disease Project similarly cites lower respiratory tract infections and malaria as among the top ten disease conditions that account for most Disability Adjusted Life Years (DALYs) (Lopez et al., 2006). Evidently, the three account for 55% of childhood mortality in Malawi. Neonatal causes which constitute deaths within 28 days of life due to single or a combination of factors, represents a critical problem that contributes to high child mortality for many developing countries (Lawn et al., 2006) including Malawi. Figure 2.3 below illustrates the commonest causes of mortality in children under five years of age in Malawi.

Figure 2.3: Causes of deaths among under-five children in Malawi



Source: GOM (2007)

As illustrated in figure 2.3 above, pneumonia, malaria, diarrhoea, HIV and AIDS related and neonatal causes account for commonest causes of childhood mortality. Demographic and Health Surveys (DHS) have thus tracked prevalence and care seeking for these conditions. Table 2.1 below presents DHS findings on prevalence of these conditions and some key child health service delivery indicators that illustrate the state of child health in Malawi. Considering the urban health focus of the study, urban and rural levels will be presented in addition to national aggregate levels of selected child health indicators.

Table 2.1: Child health outcome and service indicators trend from 1992 – 2010

Child health indicator		DHS 1992	DHS 2000	DHS 2004	MICS 2006	DHS 2010
Under-five Mortality Rate (deaths/1000 live births)	*National*	234	189	133	122	112
	Urban	205	148	116	113	113
	Rural	244	210	164	123	130
Infant Mortality Rate (deaths/1000 live births)	*National*	134	104	76	72	66
	Urban	118	83	60	70	73
	Rural	138	117	98	73	73
Neonatal Mortality Rate (deaths/1000 live births)	*National*	40	42	27	33	31
	Urban	51	30	22	30	31
	Rural	49	48	39	34	34
Prevalence of ARI (%)	*National*	14.6	26.7	18.8	8.5	6.8
	Urban	14.9	15.7	11.3	8.7	6.6
	Rural	14.5	28.3	20	8.5	6.8
Children with ARI who sought treatment from a health facility (%)	*National*	49	26.7	19.6	51.8	70.3
	Urban	54.8	48.3	22.6	74.5	67
	Rural	48.2	24.9	19.3	47.8	70.8
Prevalence of fever (%)	*National*	40.5	41.6	37.1	34.7	34.5
	Urban	37	31.9	29.9	29.5	30.7
	Rural	41	43	38.3	35.6	35.1
Children with fever who sought treatment (%)	*National*	46.2	35.2	30.5	24.9	64.6
	Urban	45.1	45.8	42.6	32.1	68.5
	Rural	27	34	28.9	23.9	64
Prevalence of diarrhoea (%)	*National*	21.9	17.6	22.3	24.1	17.5
	Urban	19.3	14.3	17.5	22	18.2
	Rural	22.3	18.1	23	24.4	17.4
Proportion of children with diarrhoea who sought care	*National*	45.4	28.3	36.4	Not	62.1
	Urban	49.3	34.9	38.7	collected	55.2
	Rural	45	27.6	36.2		63.3
Stunting Rate (%)	*National*	48.7	49	47.8	46	47.1
	Urban	35	34.2	37.8	37.5	40.7
	Rural	50.3	51.2	49.2	47.5	48.2
Full immunization coverage (%)						
	National	81.8	70.1	64.4	70.4	80.9
	Urban	87.2	78.6	70.7	76.8	75.8
	Rural	81.1	68.7	63.5	69.3	81.8
Measles immunization coverage (%)		85.8	83.2	78.7	84.4	93

Note - All child mortality indicators at national level are presented for the preceding four years of the survey while those disaggregated by rural and urban residence are presented for the preceding ten years (as available in the survey reports)

- For fever treatment, MICS reports as child receiving any appropriate anti-malaria treatment while DHS report care seeking from health provider

Source: NSO (1992; 2000; 2004; 2006; 2011)

2.3.2 Organisation and implementation of health services to promote child health and survival in Malawi

Promotion of child health and survival has received prominence on the global, regional and national health agenda in recent years. Notably, the World Health Report of 2005: *'Making every mother and child count'*; UNICEF Report of 2009 *'State of the world's children 2009: maternal and new-born health'*; and the Millennium Declaration of the United Nations on Millennium Development Goals (MDGs) (UNICEF, 2009, WHO, 2005) have been among powerful advocacy tools for explicit commitment to pursuing child health and survival strategies.

In recent years, Malawi has also prioritised maternal and child health. As demonstrated in the preceding section, while Malawi stands to achieve or even surpass MDG 4 target, numerous challenges still exist and child health indicators remain poor. Understanding the context of child health service provision in Malawi is therefore worthwhile to appreciate the prospects and constraints of the health system pertaining to promotion of child health and survival.

Child health services are delivered at each level like general health services as will be described in section 2.4.1. Nonetheless, child health interventions are implemented using various specific modalities within the Malawi health system. The subsequent section therefore describes the context within which child health services are organised, mainly focussing on existing child health implementation arrangements.

The key programmatic arrangements for implementing child health services in Malawi include the following: Integrated Management of Childhood Illnesses (IMCI); Acute Respiratory Infections (ARI) / Emergency Triage Assessment and Treatment (ETAT); Expanded Programme of Immunisation (EPI); Malaria Control Programme; and other programmes that address the broader social dimensions that influence child health and development. A brief description of each of these service provision strategies including the rationale for adoption is presented herein, subsequently.

2.3.2.1 Integrated Management of Childhood Illnesses

The Integrated Management of Childhood Illnesses (IMCI) was launched in 1992 by WHO and UNICEF as an approach intended to reduce the commonest causes of childhood morbidity and mortality in an integrated whole child focus manner and ultimately contribute to the

healthy growth and development of children (Kelley and Black, 2001). According to IMCI, these conditions are: pneumonia, diarrhoea, malaria, measles and malnutrition which account for 70% of childhood morbidity and mortality globally (Kelley and Black, 2001).

The rationale for the IMCI approach is that a sick child mostly presents with multiple illnesses that warrant an integrated set of interventions thereby providing holistic care that is effective and efficient for the family and the health system. Essentially, the IMCI approach has been seen as addressing the shortcomings of vertical disease control programmes in child health (Claeson and Waldman, 2000).

Indeed, vertical disease control programmes entail a focus (through financial investment and service improvement) in one or a few targeted diseases/conditions to an extent that improvements, when realised, are usually limited to that particular focus area as opposed to system wide effects or a holistic focus of patient/client improvement. For example, early experiences of the effect of Global Health Initiatives (GHI) such as the Global Fund Against HIV/AIDS, Tuberculosis and Malaria (GFATM) on country health systems, noted significant investment and improvements in indicators of the three diseases at the expense of strengthening the weak country health systems (Biesma et al., 2009). In addition the technical, administrative and political difficulties in delivering services in the context of multiple disease specific child health programmes have been documented (Kelley and Black, 2001).

The IMCI approach pursues to promote child health and survival by instituting interventions across a continuum of care including a community and health system focus through its three components namely: (Jamison et al., 2006).

i. ***Component 1***: Clinical IMCI which is aimed at improving skills of health workers in case management for common causes of childhood morbidity and mortality which include: pneumonia; diarrhoea; malaria; measles and malnutrition. This component is health facility based and provides training for health workers in holistic assessment and standard management of the sick child. It also provides integrated standard treatment guidelines throughout the referral chain for child health services.

ii. ***Component 2:*** Health Systems component of IMCI is aimed at strengthening the health system to ensure consistent availability of the requisite essential

pharmaceutical and medical supplies, improve service quality, referral services and ensure equity of access to child health care services.

iii. ***Component 3:*** Community IMCI which is aimed at improving child care practices within the household and community contexts where children live and grow. Globally, twelve household practices were agreed upon as essential for childhood health, survival, growth and development. However, due to specific contextual health problems, the East and Southern Africa Region (ESAR) added four key household practices in this regard.

The sixteen household practices include:

- exclusive breast feeding for 4 or if possible 6 months considering HIV/AIDS infant feeding guidelines;
- provide fresh and energy nutrients for complementary feeding while breast feeding continues up to 2 years;
- provide adequate micronutrient supplementation;
- promote child psychosocial development by being responsive to his/her care, stimulation etc;
- safe disposal of foecal material and hand washing;
- use of insecticide treated nets for children;
- prevent child abuse and neglect and take action where there is evidence of its occurrence;
- adopt behaviour for prevention and care for HIV/AIDS affected households and orphans;
- feed child and offer fluids even when child is sick;
- give children appropriate home treatment for illnesses;
- take action to prevent and manage injuries and accidents;
- take children for a full immunization as scheduled;
- recognize when sick child needs treatment from outside home and seek appropriate care;
- adhere to treatment, follow up and referral requirements;
- every pregnant woman receives minimum of four antenatal visits, is immunized against tetanus and seeks appropriate care when needed;
- active male participation in child care and reproductive health initiatives.

The four household practices added by the ESAR include those related to health problems of HIV/AIDS, child abuse and accidents, and the participation of fathers in child care.

In Malawi, implementation of IMCI started with the first two components in 1998 (GOM, 2005). The third component started later in 2000 beginning with four of the 28 health districts. By 2006, IMCI was holistically implemented in all districts in the country with varying levels of coverage (Personal communication with MOH official).

The third component of IMCI was eventually integrated with another strategy – the Early Childhood Care for Survival, Growth and Development (ECCSGD) due to the similarities and synergies between the two strategies (GOM, 2008). This merger became effectively known as ECD/CIMCI approach, initially implemented in five districts and expanding to nine by 2002 and eleven districts by 2004. To date ECD/CIMCI interventions are implemented in health districts across the country (Personal communication with MOH official).

A key family practices follow up survey conducted in 2004 demonstrated some significant positive change in some key family practices, among them being: increase in use of Insecticide Treated Nets (ITNs) for under five children from 48% in 2000 to 64% in 2004; improved safe storage of drinking water by households from 24% in 2000 to 82% in 2004 (GOM, 2005). Other positive changes include reductions in case fatality rates among paediatric admissions. Nonetheless, some key family practices have not improved and others worsened such as prevalence of proper hand washing decreased from 69% to 37%. More recent data on some of the key practices is currently unavailable to make meaningful conclusions over the second decade of IMCI implementation in Malawi.

From the preceding description of IMCI, it can be noted that this PhD research predominantly focusses on the community component of IMCI (C-IMCI) albeit some aspects relate to the health system.

2.3.2.2 Expanded Programme on Immunisation (EPI)

The Expanded Programme of Immunisation (EPI) is a global strategy that was established in 1979 with an aim of achieving significant reduction (in some cases with a goal of eradication) of diseases, largely in early stages of human development. Malawi, like many other countries, embraced this concept and consequently achieved a Universal Childhood Immunisation (UCI)

in 1989 with over 80% coverage for all antigens (GOM, 2008). This high immunization coverage has been sustained, to the extent that there has been significant reduction in morbidity and mortality resulting from vaccine preventable diseases. Nonetheless a measles outbreak was confirmed in 2009 but was controlled within the year. According to the 2010 Malawi Demographic and Health Survey, full immunization coverage stands at about 82% with only 2% of the children who have not received any vaccination (NSO and ICF-Macro, 2011).

The EPI therefore constitutes an integral strategy to promote child health, survival, growth and development in Malawi. Implementation of the EPI strategy entails administration of vaccines appropriate for age of the child as per immunisation schedule. This is predominantly undertaken during the under-five child health clinics and immunisation campaigns at health facilities or mobile clinics. The disease conditions targeted for prevention within the EPI package include: Tuberculosis, Polio, Hepatitis B, Diphtheria, Pertussis, Tetanus, Haemophillus Influenza B and Measles. More recently, a Pneumococcal Conjugate Vaccine (PCV) and Rotavirus Vaccine have been added to the EPI package to pursue reduction in morbidity and mortality resulting from pneumococcal pneumonia, meningitis (for PCV) and diarrhoea (for Rotavirus vaccine) (Personal Communication with MOH official).

2.3.2.3 Malaria Control Programme

Malaria is endemic in Malawi and is one of the leading causes of morbidity and mortality among children under the age of five years (GOM, 2007). Consequently, Ministry of Health established the National Malaria Control Programme (NMCP) to guide a malaria control agenda.

Key malaria control strategies, which effectively also target children include: distribution and promoting usage of Insecticide Treated Nets (ITNs) and more recently Long Lasting Insecticide Treated Nets (LLITNs) among pregnant women and under-five children; Intermittent Preventive Treatment in pregnancy (IPTp) where pregnant women are given 3 doses of an antimalarial - Sulphadoxine Pyrimenthamine (SP); standard case management of malaria for children and adults; health education on symptom recognition and care seeking, and Indoor Residual Spraying (IRS) to break the agent-host interaction within the epidemiological triad.

According to a recent Malaria Indicator Survey (MIS): 48% of children under the age of five years had slept under an ITN a night before the survey; 8.5% of the households had reported IRS for their households within 12 months of the survey; 53.2% of the women had received two or more doses of SP for IPT (GOM and ICF, 2012). This data clearly suggests that there is still need for more efforts to achieve higher coverage of malaria interventions.

2.3.2.4 Acute Respiratory Infections Program (ARI)/ Emergency Triage Assessment and Treatment (ETAT)

Acute Respiratory Infections (ARI) constitutes one of the major causes of morbidity and mortality among under five children in Malawi (GOM, 2008, Bowie and Mwase, 2011). In response a vertical disease programme was established to coordinate effective implementation of ARI management within the clinical setting. Areas of focus for this strategy entailed training health workers in standard case management for ARIs and lobbying for availability of essential pharmaceutical and other medical supplies to ensure effective ARI management at health facility level.

The Emergency Triage Assessment and Treatment (ETAT) initiative aims at reducing childhood deaths within a health facility setting. Its focus entails provision of high quality emergency care for the sick child. Essentially, this strategy is aimed at addressing the problem of high proportions of deaths in the first 24 hours of admission estimated at about 50% of all child deaths in hospitals in 2010 (Molyneux, 2010). This strategy therefore entails: skills development for health workers to enable them effectively undertake triage and provide quality emergency care and standard case management for the sick child; and strengthening the health system to provide requisite pharmaceutical and medical supplies.

The ARI and ETAT programmes were eventually merged in 2009 due to the synergistic nature of the interventions and approaches.

2.3.2.5 Paediatric HIV/AIDS interventions

Since the initial HIV positive result in 1985, HIV and AIDS has progressed to a significant socio-economic and public health challenge in Malawi affecting all age groups. Children have increasingly been infected through parent-to-child transmission. In response, the Government of Malawi has placed Prevention of Mother to Child Transmission (PMTCT) of HIV as an integral aspect of its HIV and AIDS response. To date, there are 607 PMTCT sites,

from 119 at the end of 2006 (GOM, 2012c). Early Infant Diagnosis (EID) of HIV and follow up of HIV exposed infants have also been strengthened as key components of the PMTCT package. Provision of paediatric Anti-Retroviral Therapy (ART) has also recently been strengthened to promote the health and survival of HIV infected children.

2.3.2.6 Nutrition interventions

Nutrition related disorders constitute a significant public health problem among Malawian children. Evidently, stunting rates have remained high with about half of the children being stunted and no noticeable improvements have been noted over the years (refer to table 2.1). Consequently, preventive, curative and rehabilitative strategies for children at risk of and affected by acute malnutrition have been instituted within the Malawi health system. The salient interventions in this regard include: growth monitoring in under-five clinics; promotion of Exclusive Breast Feeding (EBF); Vitamin A supplementation; treatment of acute malnutrition in Nutrition Rehabilitation Units (NRU) that are largely based in paediatric wards and through Community Therapeutic Care (CTC) with ready-to-use therapeutic foods (GOM, 2008).

Coverage of various nutrition interventions have shown a significant increase over the years. Evidently, Exclusive Breast Feeding has increased from 3% in 1992 to 71% in 2010 (NSO and ICF-Macro, 2011, NSO and Macro-International, 1994). Vitamin A supplementation similarly shows an increasing trend and an increase in number of NRUs over the years has meant provision of treatment for acute malnutrition to more malnourished children over the years.

2.3.2.7 Other child health and survival programmes / strategies

Most of the programmatic strategies highlighted in the preceding sections fall within the Ministry of Health and are structurally instituted to be child health specific or have a specific child health component. It is important to acknowledge that other approaches exist within the Ministry of Health and other sectors in Malawi that contribute to efforts to promote child health and survival. These have been included in the Accelerated Child Survival and Development (ACSD) agenda. The salient ones highlighted in child health policy documents include:

- *Early Childhood Development (ECD)*: a multi-sectoral approach that promotes; community based interventions pertaining to child psychosocial development through

Community Based Child Care Centres (CBCC); girl child education and adult literacy programmes.

- *Safe water and sanitation*: an integrated approach for Water Sanitation and Hygiene (WASH) that promotes access to safe drinking water; sustainable sanitation technology and promotion of hygiene practices such as hand washing. This is a multi-sectoral programme which is aimed at contributing to reduction of morbidity and mortality resulting from diarrhoeal diseases.
- *Maternal health programmes*: all interventions intended to improve the health of mothers play a significant role to child health and survival. In Malawi, the Safe Motherhood Initiative (SMI) is a case in point through its efforts to; reduce Total Fertility Rate (TFR) through family planning promotion; Focused Antenatal Care (FANC) attendance; advocacy for delivery by skilled attendant; and quality postpartum follow up, among others.

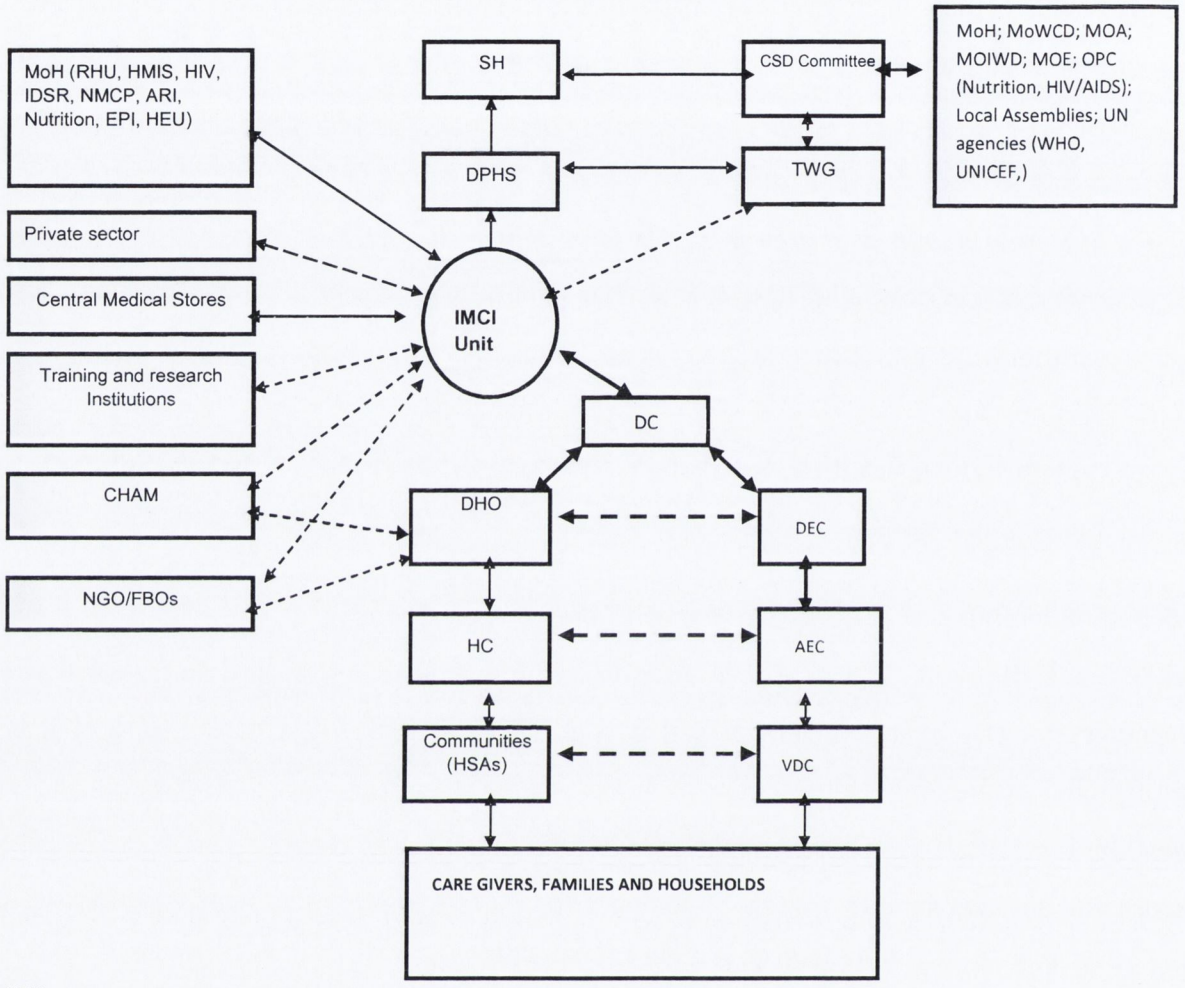
2.3.3 Leadership and governance for child health in Malawi

While leadership and governance for child health operate within the broader governance structures for the health system as will be described in section 2.4.2, there are specific institutional arrangements pertaining to child health. The Accelerated Child Survival and Development (ACSD) represents an overarching strategy that guides the promotion of child health and survival agenda in Malawi. An institutional framework to promote inter-sectoral (between and among sectors) and intra-sectoral (within health sector) collaboration in implementation of ACSD strategy is provided for within child health policy content in Malawi.

The National Child Survival and Development Committee (CSDC) and the Child Survival and Development Technical Working Group (CSD-TWG) are cases in point. The CSDC is a multi-sectoral committee with membership of Principal Secretaries and senior government officials from government ministries and two key United Nations (UN) agencies namely WHO and UNICEF as illustrated in Figure 2.4. The CSDC oversees implementation of the ACSD policy largely through providing policy visibility and high level advocacy and coordination (GOM, 2008). The CSD-TWG on the other hand constitutes a multi-sectoral committee of technocrats mainly comprising directors and senior technical officers from participating partners. The CSD TWG mandate entails provision of technical advice to policy and implementation levels (GOM,

2008). This institutional arrangement as illustrated by Figure 2.4 below was set up in 2006 for the implementation of ACSD.

Figure 2.4: Institutional framework for implementing ACSD



KEY:

SH	Secretary for Health
DPHS	Director Preventive Health service
IMCI	Integrated Management of Childhood Illness
DHO	District Health Office
HSAs	Health Surveillance Assistants
NGO	Non Governmental Organization
CMS	Central Medical Stores
TWG	Technical Working Group
MoH RU	MoH Health Sciences Research Unit
RHU	Reproductive Health Unit
HIVU	HIV Unit
DEC	District Executive Committee
AEC	Area Development Committee
VDC	Village Development Committee
CHAM	Christian Health Association of Malawi
CSD	Child Survival and Development

CBO – community based organizations

FBO – Faith based organizations

------ Liaison / Consultative reporting

___ Direct Reporting

Source: GOM 2007b

As it can be noted from the institutional framework, the Integrated Management of Childhood Illnesses (IMCI) Unit, based within the Ministry of Health under the Department of Preventive Health Services, is the central point of the framework and performs the coordination role for inter-sectoral committees and implementation of child survival programmes at district level. The boxes on the left of the institutional framework are

predominantly stakeholders within the health sector and either fall within direct implementers of the ACSD interventions or provide direct support. For example: the Central Medical Stores (CMS) is an autonomous public trust that is responsible for national procurement and distribution of medicines and pharmaceutical products including those related to promotion of child health; CHAM and the private sector including Non-Governmental Organisations (NGO) and Faith Based Organisations (FBOs) (as will be described in section 2.4.1) have a role of implementing ACSD interventions in their network of health facilities; MOH and all the vertical child health related programmes undertake functions of a health system in this regard pertaining to child health; training and research institutions are crucial for generation of health workforce and health information for evidence based policy and practice.

The CSD Committee and CSD TWG towards the top right of the figure have been described earlier and specifically advance the policy visibility, stewardship, and multi-sectoral aspects of ACSD implementation. The box on the top right depicts central level stakeholders including various government ministries and departments and UN agencies which act through the two multi-sectoral structures (CSDC and CSD-TWG) to support implementation of ACSD from policy to practice. The intention of this arrangement is to influence social determinants of child health and a buy in from all significant stakeholders.

The boxes depicted from the middle to the bottom reflect district level implementers of ACSD interventions, embracing both government and community structures within the Ministries of Health and Local Government. The institutional arrangement therefore provides the policy intended composition and implementation of ACSD interventions at all levels from household to health policy making.

While the above institutional framework reflects the ideal structure which pursues intra-sectoral (within the health sector) and inter-sectoral collaboration, in practice the situation seems different, reflecting the policy-implementation gap. For example, from the researcher's observation and experience, there are inadequate linkages between child health programmes within Ministry of Health despite the institutional framework providing for such linkages. Other commentators have similarly argued that establishing a child health department or unit within Ministry of Health would provide better coordination than is the

case at present with various child health programmes with different strategic plans and policies.

Moreover, there is little policy cohesion in some aspects within the policy content of the child health vertical programmes. The CSDC and CSD-TWG also do not seem to be functioning to the levels as originally intended during policy development. For example the CSDC has not met for a long period of time (Personal communication with MOH official). The inexistence of committees or some form of institutional arrangements to involve other stakeholders (as equivalents of the CSDC or CSD-TWG) at district level arguably misses the opportunity to address social determinants of health at implementation levels.

Effectively, the Millennium Development Goals Progress Report for Malawi asserts: *"weak inter-sectoral collaboration has constrained the health sector in dealing with determinants of poor child health such as water, sanitation and malnutrition" (GOM, 2009a).* This is crucial as it has been widely recognized that major determinants of health, including child health, fall outside conventional boundaries of the health sector (NZAID, 2003, PHAC, 2007, von Schirnding, 2002). It is through tackling these social determinants of health, the so called *'causes of the causes'* (CSDH, 2008) that significant and sustained improvements in child health indicators can be achieved.

2.4 An overview of the Malawi health system

Understanding the Malawi health system context is essential to appreciate the broader context within which the child health subsystem operates and the environment within which this PhD research was undertaken. A six building blocks health system framework proposed by the World Health Organisation (WHO) will guide this brief description of the Malawi health system.

The World Health Organisation (2007) posits that a health system has six building blocks namely: health service provision; leadership and governance; health financing; health workforce; vaccines and medical products; and health information which operate interdependently in order to achieve the ultimate health system goal of improving the health status of the country's population. Two of these building blocks, namely health service provision and leadership and governance have already been described with specific reference to child health (*see section 2.3*). The descriptive focus on these two in the subsequent sections

will therefore be on the general Malawi health system, while for other building blocks, a combined description of general and child health specific elements will be pursued.

2.4.1 Health service provision

Health service provision is considered a key building block for the system to achieve its principal objective of improving the health status of the population (WHO, 2007, WHO, 2000). Some key dimensions of health service delivery include: how services are organized; key providers of health services; how services are paid for; extent of coverage and distribution of services.

According to the 2007 Health workforce and facilities census, the Government of Malawi's Ministry of Health (MOH) is the major provider of formal health services, contributing 55% of health facilities. Christian Health Association of Malawi (CHAM) – an umbrella organisation constituting most health facilities owned by Christian churches operating on a not-for-profit basis contributes 14% of the health facilities. The private for profit sector operates 20% of the health facilities, NGOs provide 6% and the rest are run by statutory corporations which are autonomous public owned corporations (GOM, 2007a). Even though the use of traditional healers by the population is known and documented (Munthali et al., 2005), and that MOH has recently recognised them as partners in health service delivery, their relative contribution to health service delivery in Malawi has not been documented.

It is worthwhile to note that the health service provision landscape in Malawi has witnessed a significant growth of the private sector in health service provision in a little more than a decade. Compared to the scenario depicted above, the previous scenario was such that MOH and CHAM contributed 60% and 37% of health service provision respectively and the remaining 3% was shared among statutory corporations and private sector (GOM, 1999).

Ministry Of Health policy in service provision is to ensure that all Malawians have access to the Essential Health Package (EHP) – a package of cost effective interventions targeting the commonest causes of morbidity and mortality in Malawi (GOM, 2004a, GOM, 2004d, GOM, 2011b). An initial EHP was framed in 2004 with cost effective interventions addressing eleven disease conditions. The eleven disease conditions included: vaccine preventable diseases; malaria; adverse maternal and neonatal outcomes (including Family Planning, Reproductive Health and Safe Motherhood Initiative); tuberculosis; Acute Respiratory Infections (ARI);

acute diarrhoeal diseases; Sexually Transmitted Infections (STI) including HIV and AIDS; schistosomiasis; nutritional deficiencies; eye, ear and skin Infections and common Injuries.

However, the increasing epidemiological importance of conditions like cancers; mental health disorders and cardiovascular diseases has warranted their inclusion in the list of EHP conditions. Consequently, cost effective interventions addressing these conditions have been added to the current EHP as enshrined in the Health Sector Strategic Plan (HSSP) (2011-2016) (GOM, 2011b).

A key policy strategy promoting access to EHP is the free provision of health services at point of delivery in public health facilities (GOM, 1999, GOM, 2011b). Despite this policy and practice, findings from the recent National Health Accounts (NHA) estimated that as much as 26.9% and 12.3% of the household out of pocket expenditure on health is made at public district hospitals and health centres respectively (GOM, 2012a). The fact that about a third of out-of-pocket expenditure is made at public health facilities within the context of a policy of free services at the point of use and high poverty levels is obviously a worrisome situation with potential to undermine efforts to achieve universal health coverage. CHAM and other private providers charge user fees, albeit with variations in that CHAM charges are in general, lower than private for profit providers.

In efforts to increase access and reduce inequities in access to health services, MOH has established partnership with some CHAM health facilities, especially those located in areas where there are no public facilities. In this partnership, Service Level Agreements (SLA) have been signed to ensure that patients / clients access services at CHAM facilities for free as costs are covered by MOH, effectively removing the financial and distance barriers to health services. Most SLAs in operation cover maternal and child health services, albeit few of them being for child health services (GOM, 2011b). Child health services covered by the SLAs include:

- all activities performed in the under-five clinics such as growth monitoring, vaccinations, treatment of minor childhood ailments, health education services;
- treatment of childhood conditions in the EHP list of conditions such as malaria, diarrhoea, and ARI;

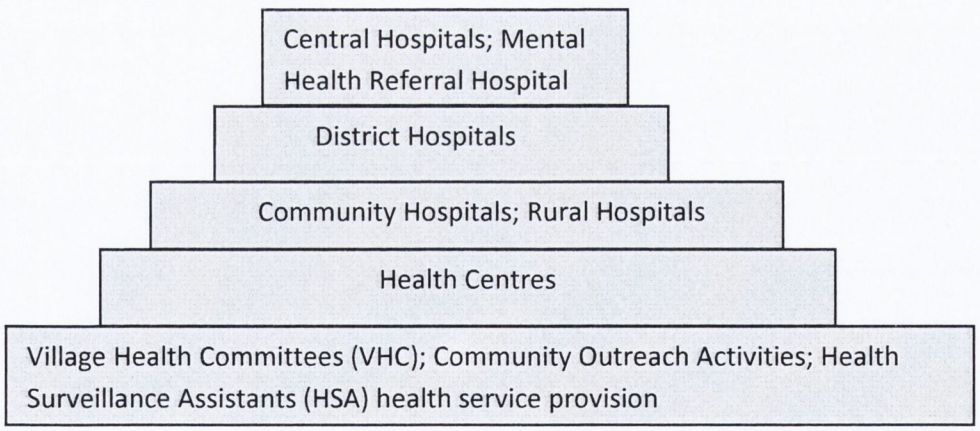
- paediatric admissions and ambulatory services for common childhood illnesses

Recent challenges noted in implementation of SLAs such as: increasing costs to deliver health services leading to non-reimbursements or delayed reimbursement, diminishing trust between contracting parties and lack of effective monitoring and evaluation, threaten sustainability of these agreements (GOM, 2011a).

The Malawi health service delivery system is organised in a pyramid structure through which primary, secondary and tertiary levels of health care services are provided as outlined below:

- *Primary level* constituting basic health services offered at health centre and lower levels such as health post and community level through community outreach clinics and Village Health Committees (VHCs)
- *Secondary level* constituting health services offered at district hospital level, acting as a referral point for primary level care
- *Tertiary level* which constitutes central hospitals which offers specialised services hence a referral point for secondary level care

Figure 2.5: Organisational structure of the Malawi Health System



It is noteworthy that the figure above reflects an ideal organisation of the health service provision structure and denoting a referral pattern as enshrined in policies. The reality is that even secondary (district hospitals) and tertiary (central and specialised hospitals) levels of care provide health care that should otherwise be provided at the lower primary care levels. Potential policy decisions such as charging bypass user fees to discourage use of tertiary

facilities for primary care have been discussed at MOH central level but not yet explicitly expressed as policy for nationwide implementation.

With regard to geographical distribution of health services, the Ministry of Health policy is that its network of health facilities should be distributed to ensure that every individual is within a maximum of 8km radius of a health facility. In 2011, the MOH estimated that 81% of the Malawi population is within an 8 km radius even though striking district differentials were noted (GOM, 2011b).

About 74% of public health facilities are reported to have optimal capacity to provide a full EHP (GOM, 2011b). This reflects a significant improvement from a Calcon (2003) study report that noted that only 10% of Malawi's public health facilities had capacity to provide a full EHP. Nonetheless, it is very probable that this health service indicator is unstable considering the frequent and intermittent changes in the availability of medicines and other medical supplies and the high attrition rates of human resources in various health facilities.

One of the key challenges for Malawi has been inequitable distribution of health services (GOM, 2004c) which significantly contributes to inequity in access to and utilisation of health services. For example rural-urban inequities to the disadvantage of rural areas have been documented with respect to distribution of health infrastructure and human resources (GOM, 2004c). Inequity in utilisation of health services has also been noted between the rich and the poor and across different education levels and other social dimensions (NSO and ICF-Macro, 2011, NSO and ICF-Macro, 2005, NSO and ICF-Macro, 2001). For example, Zere et al. (2007b) report inequities in use of maternal and child health services to the advantage of the rich relative to the poor. Using data from the Malawi Demographic and Health Surveys (MDHS) of 1992, 2000 and 2004, they specifically noted substantial increase in inequity in indicators of: proportion of children with ARI seen by health worker and ARI treatment in a public facility.

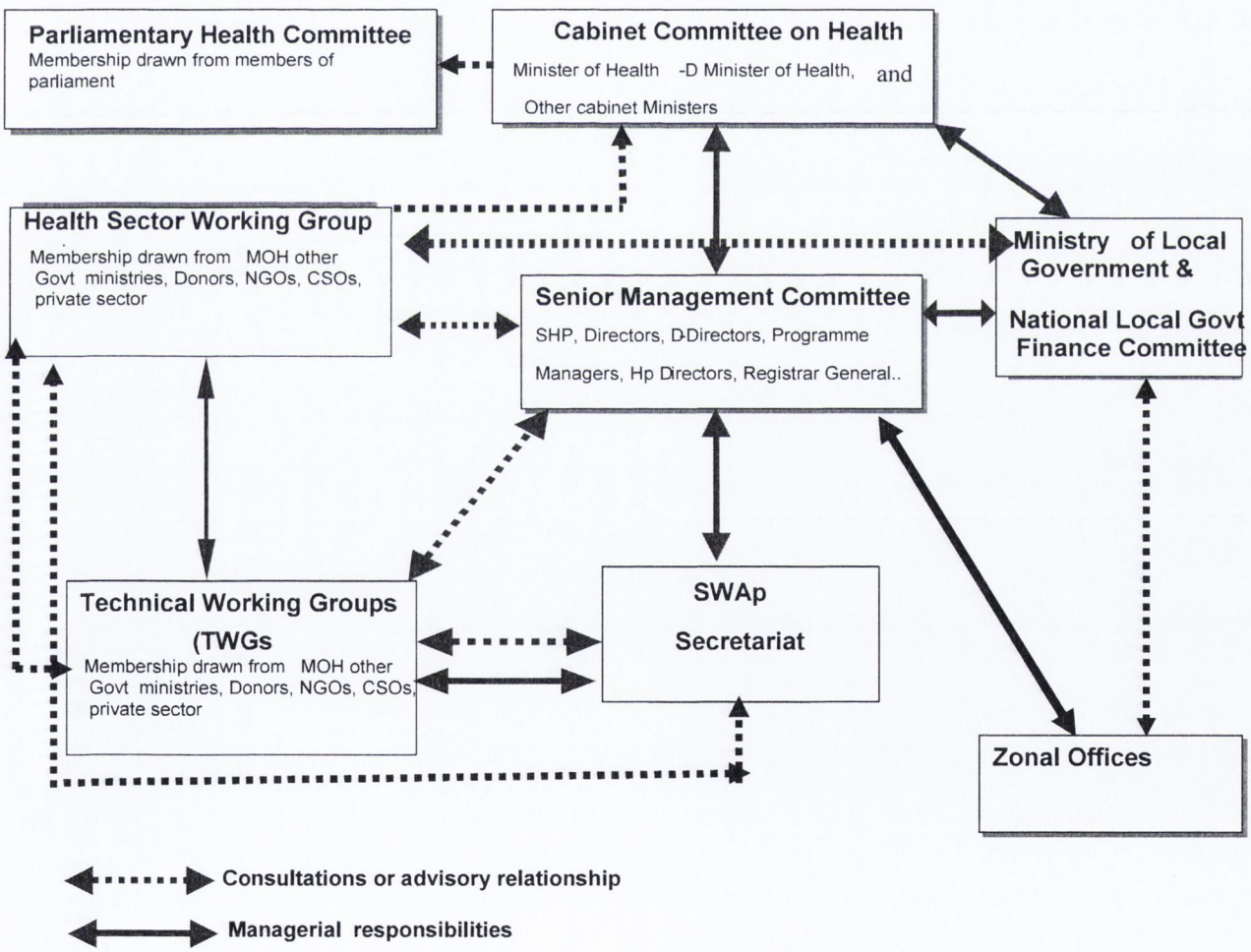
2.4.2 Leadership and Governance

The leadership and governance building block of the health system entails providing strategic policy direction, exerting influence through regulation and advocacy; and collecting and using information (WHO, 2007). In Malawi, the central offices of MOH provide policy and strategic direction through development and monitoring of health policies, national health technical guidelines and strategic plans for the health sector. The Malawi health system was largely

decentralised following a Government Decentralisation Act enacted in 1998 and a Ministry of Health Decentralisation Policy of 1999 (GOM, 1999, GOM, 1998). At present, while functions such as service provision, health planning and financial management have been devolved, human resource management and development has not yet been devolved to the District Assembly level.

Consequent of policy intention to move to a Sector Wide Approach (SWAp) as expressed in the Malawi National Health Plan 1999-2004 and the proceeding discussions, Malawi adopted a SWAp in 2004 (GOM, 2004c). In order to ensure effective performance of the system since adoption of the Health SWAp, health sector governance structures were set up as illustrated in Figure 2.6.

Figure 2.6: Malawi Health Sector Governance Structure



Source: GOM (2011)

As it can be noted from the health sector governance matrix above, performing the leadership and governance (stewardship) function of the health system is multifaceted and characterised by multiple, and in many ways, complex interactions. The top two level structures, namely; the cabinet committee on health and the senior management committee are crucial for the performance of the entire health sector. Technical Working Groups (TWG) and Departments guide performance of specific technical areas of the health sector (GOM, 2011c). The Zonal Offices roles constitute monitoring policy implementation and providing general technical direction at District Health Office level.

The parliamentary committee on health generally performs the advocacy role. The Health Sector Working Group (HSWG) performs the advocacy role and is an attempt to pursue inter-sectoral collaboration in health. Considering the decentralised context of the health system, the relationship between the Ministry of Health on the one hand and the Ministry of Local Government (MLG) and the National Local Government Finance Committee (NLGFC) on the other hand, are more prominent than with other government sectors. This is because the MLG and NLGFC have jurisdiction over the District Assemblies which include the District Health Offices (DHO).

While figure 2.6, accurately represents public institutional frameworks and the relationships thereof, undertaking the stewardship function implies a broader view of the entire health sector (WHO, 2007) and not only the public system as the diagram portrays. Other significant institutional frameworks such as the health regulatory bodies, professional associations and private health sector umbrella organisations are existent. However the nature of relationships of these entities with government structures and how the stewardship function is performed pertaining to the private sector is not adequately portrayed in the diagram, apart from depicting their representation in some governance structures.

2.4.3 Health financing

Health financing is a cross-cutting health system building block affecting performance of all building blocks (WHO, 2007a). There is evidence that increased investment in health is closely associated with improvements in health indicators (Green, 2007). While the Malawi health sector has witnessed a significant increase in the resource envelope since the adoption of a SWAp, it still faces challenges of financial resource inadequacy to effectively perform its

functions and ultimately achieve its goals (Mwase, 2010). Evidently, whereas the original cost of delivering the EHP per capita per annum was US$ 17.53 (GOM, 2004c, GOM, 2004a) and the revised one estimated at US$ 28.58 per capita per annum, combined Government of Malawi and development partners contributions only translated to a US$ 11.1 per capita per annum allocation (GOM, 2007b) representing a shortfall of US$ 17.47.

Additionally, according to National Health Accounts (NHA), Total Health Expenditure (THE) per capita per annum averaged at US$ 20 over 2002 to 2005 and US$ 34 over 2006 to 2009. This expenditure falls far below the US$ 54 per capita per annum recommended by the WHO Commission on Macroeconomics and Health for delivery of basic health services in low and middle income countries (GOM, 2012a, GOM, 2007b).

A child health subaccount of the NHA unearth a similar pattern of substantial inadequacy of financial resources as per capita expenditure averaged US$ 12 and US$ 18 for 2002 to 2005 and 2006 to 2009 fiscal years respectively (GOM, 2012a, GOM, 2007b). The required per capita expenditure by the health and nutrition sectors to implement ACSD strategy was estimated at about US$ 29 in 2008 and rising to about US$ 50 by 2012. In order to implement a full ACSD strategy (including interventions in all other sectors such as Agriculture, Education, child protection, water and sanitation etc), it was estimated to cost about US$ 39 per capita in 2008 and rising to US$ 61 by 2012 (GOM, 2008). This particular context of financing child health services underscores the grave inadequacy of financial resources.

Despite an increase in per capita expenditure per annum for child health in recent years (US$ 12 versus US$ 18), evidence from NHA suggests a decline in relative allocation to and expenditure on child health services in Malawi. For example, expenditure on child health as a proportion of Total Health Expenditure was at an average of 17% in 2002 to 2005 and declined to 8.1% for the 2006 to 2009 financial years (GOM, 2012a, GOM, 2007b).

The NHA also indicates higher investment in curative services than preventive public health programmes for both general and child health services (GOM, 2012a, GOM, 2007b). Public health services are regarded as less costly and have the capacity for wider coverage. Moreover, the epidemiological profile for Malawi constitutes disease conditions that are amenable to available public health prevention strategies.

Some authors argue that if countries increased spending on public health interventions, MDG 4 would be achieved (Gupta et al, 2007 cited in Pearson, 2009). The current Health Sector Strategic Plan (2011-2016) illustrates the commitment for greater investment in health promotion hence represents a step towards this direction. However, whether subsequent financial resource allocation will follow this policy commitment is yet to be seen. Previous experience has demonstrated the inherent difficulties for policy shifts in resource allocation in spite of existence of similar evidence. This will probably continue to prevail.

With regard to financing agents for the Malawi health system, development partners contribute the most of health sector financial resources. Data from three NHAs conducted so far affirm this assertion including for child health subaccounts. To this end, some health financing experts have labelled the Malawi health system vulnerable and unsustainable in the event of donor withdrawal or significant decline in foreign aid (Mwase, 2010). Table 2.2 below illustrates contributions by various financing agents over the years.

Table 2.2: Financing sources for the Malawi Health System

	General Health				Child Health			
Year	Percentage of Total Health Expenditure			*OOP expenditure as % of Private Health Expenditure*	Percentage of Total Health Expenditure on Child Health			*OOP Child Health expenditure as % of Private Health Expenditure*
	Public	*External sources*	*Private*		*Public*	*External sources*	*Private*	
1998/1999	26	29	45	57.9	NA	NA	NA	NA
2002/2003	35.4	45.9	18.7	64.5	41	39	20	14
2003/2004	22.5	62.3	15.2	67.9	28	49	23	18
2004/2005	25.4	60	14.6	63.8	30	49	21	14
2005/2006	21.6	60.7	18.2	49.1	NA	NA	NA	NA
2006/2007	13.4	69.1	17.5	69.8	16.3	43	30.8	89.6
2007/2008	22.4	61.9	15.7	66.2	19.2	51.3	29.5	87.7
2008/2009	18	65.6	16.5	68.2	18.9	48.4	32.7	87.4

Note: - External sources entail development partners and private source constitutes combined health financing sources of private health insurance, out-of-pocket (OOP) expenditure, and insurance offered by employers etc.

- NA entails that data is not available for the years

Another significant facet of the health financing function is fair financial contribution (WHO, 2000, McIntyre, 2007). Inherent in this statement is the key issue of avoidance of catastrophic health expenditure - meaning people should not be impoverished as a result of paying for health care (Xu et al., 2003). In this regard, literature discourse seems to converge on the fact that an effective health system should adhere to the principle that *'financing health care should be according to ability to pay and access to health services should be according to need'* (McIntyre, 2007; p 5).

This aspect of health financing becomes more relevant in considering vulnerable groups such as the urban poor residing in slums. On this basis, the Malawi health system has made significant strides considering that there are no user fees at the point of health service access in public facilities. Its taxation means of financing the health system takes into account relative levels of income. However, the out-of-pocket payments made to public health facilities as cited under service provision (section 2.4.1) earlier, remains a point of concern.

Furthermore, the NHA indicate that household payment through out of pocket expenditure on child health services are constantly high at an average of 30% of Total Expenditure on Child Health (GOM, 2012a). This situation is worrisome considering that households still have the burden of payment in a health system where health services are predominantly free at the point of use. This expenditure on child health services could be catastrophic and affect access to and utilisation of child health services especially by poor households in both urban and rural settings.

The WHO (2005) asserts that *"where out-of-pocket spending is less than 15% of total health spending, very few households tend to be affected by catastrophic payments"* Over the eight fiscal years covered by the four NHAs, out-of-pocket expenditure on all health services has only exceeded 15% of Total Health Expenditure (THE) in 1998/99 (when it was 26%). Afterwards for the years assessed out-of-pocket expenditure has been 12.1%; 9.6%; 9% and 8.9% of THE in 2002/03; 2003/04; 2004/05 and 2005/06 respectively and an average of 12% for the 2006/07 to 2008/09 fiscal years (GOM, 2012a, GOM, 2007b, GOM, 2001). This phenomenon is encouraging as it generally pursues financial risk protection from health expenditure albeit acknowledging the high out of pocket expenditure on child health services.

Allocation of financial resources from the centre to the peripheral is another critical element in health financing. Green (2007) and Zere et al. (2007a) argue that there is need to have an explicit criteria to allocate resources according to health needs of different geographical areas (such as districts) so as to achieve equity in resource allocation. The use of a needs based resource allocation formula has been advocated in health financing literature (Green, 2007).

Over the past few years, the MOH has come up with a formula of allocating resources from central to district levels. The formula includes variables such as IMR, stunting rate, poverty levels (as proxy indicators of health need) and other key indicators such as population, and Out Patient Department health service utilisation (Manthalu et al., 2010). Budget allocations to District Health Offices (DHOs) should therefore ideally depend on relative health disadvantage and the available resource envelope.

However, numerous challenges have been noted in implementation of this formula over the years, to an extent that it has not been used to determine allocations during some years. Some of the challenges include: unpredictability of funding, significant resource shifts (reductions or additions) to previous allocations within some districts to an extent that worries for absorptive capacity, limited time for rigorous budget reviews and lack of frameworks and arrangements to enforce the use of a formula have been cited (Personal communication). To this end, equity in allocation of financial resources to the peripheral has not been guaranteed.

2.4.4 Health workforce

A well performing health workforce is essential to attainment of health system goals. WHO (2007) posits that the health workforce building block constitutes aspects of: availability, competency, responsiveness and productivity of the health workforce.

Over the past few years, the Malawi health system has made significant strides in increasing availability of its health workforce (GTZ, 2007) but continues to face key challenges in this building block. Moreover, shortage of the health workforce is cited as one of the major challenges to attainment of Millennium Development Goals (GOM, 2009a).

Prior to 2004, the human resource situation in Malawi was described as 'critical', 'dangerously close to collapse' and in an emergency state. Evidently, prior to 2008, with a total doctors and

nurses (including midwives) density of 0.61 per thousand population, Malawi was slightly above the 0.5 density which was cut off point that WHO defined the 10 worst served Sub Saharan African countries (McCoy et al., 2008). The few available health workers were also inequitably distributed. A World Bank mission to Malawi reported that 65% of the doctors were in two hospitals in major cities (World Bank, 2003).

Consequently, an Emergency Human Resource Programme (EHRP) 2004-2011 was developed. Its key strategies included: increasing output in health training institutions; improving the working environment for health workers; introducing monetary incentives notably a 52% salary increase for health workers; provision of houses for health workers; and introducing special incentives for health workers in hard to reach areas (GOM, 2004c).

The EHRP has had a significant impact with key results being: output of health workers from training institutions has doubled for medical doctors and tripled for nurse/midwives and other cadres; retention of health workers within public health facilities; and reduction of vacancy rates for many cadres (GOM, 2011b). Nonetheless, despite improvements, vacancy rates in the Malawi health system are still high.

With regard to child health services, the Malawi health system continues to face problems of inadequacy of health workers with specialty training in child health. Other health workforce problems in the broader health system context in Malawi, such as inequitable distribution of health workers still remain and also affect child health service delivery.

2.4.5 Health Information

The health information building block is cross cutting. It entails generation of key information from all health system building blocks and using the information to make strategic decisions that ultimately affect the entire health system (WHO, 2007). Health information has three distinct but related domains namely health information on: health determinants; health systems performance; and health status.

Health information in Malawi is collected at all levels of health service delivery through structured registers and reporting formats. The Central Monitoring and Evaluation Division (CMED) of Ministry of Health is responsible for collation and consolidation of information to present a national picture. Information on determinants of health is provided through

population surveys such as Integrated Household Survey; Demographic and Health Surveys; Welfare Monitoring Surveys among others.

Key challenges have been noted in the health information system, including: late submission of health information to higher levels; incompleteness of data that is passed on to the next level; and limited use of data for decision making (GOM, 2009b). Another key challenge relates to disaggregating data to make it more meaningful for decisions pertaining to some key population groups. For example, there is paucity of data analysis by geographical location among different population groups such as urban slum and the rest of the urban. Linkages of health information domains such as information on health determinants and health status data are lacking to the extent that health service delivery decisions have predominantly adopted the biomedical approach. These challenges relate to the child health system in the same way they relate to the entire health system.

2.4.6 Medical products, vaccines and technologies

Ensuring equitable access to essential medical products, vaccines and technologies that are safe, of good quality and proven effectiveness and cost-effectiveness is another key element of a health system (WHO, 2007).

In Malawi, the Central Medical Stores (CMS) is an entity responsible for procurement and logistics management of medicines and other medical supplies. MOH policy goal entails ensuring availability of essential drugs and supplies at all service delivery levels (GOM, 2011b). However persistent stock outs of essential drugs for treatment of childhood and adult illnesses especially at health centre level (GOM, 2009b) constitutes a major impediment to effective service delivery.

As one way of improving accessibility of pharmaceutical products and achieving efficiency and equity of access to medical products and vaccines, MOH and development partners have instituted a reform agenda that has led to transformation of CMS from a Treasury Fund to a Public Trust (GOM, 2009b). Under the Trust arrangement, CMS will operate as an autonomous quasi business entity and is hoped to improve efficiency and effectiveness in its service delivery.

2.5 Summary of the Chapter

In this chapter, the state of child health including child health service organisation and the Malawi health system have been described as context of the PhD research. It has demonstrated positive gains in so far as child health indicators are concerned including that Malawi is one of the few developing countries likely to achieve or even surpass the MDG 4 target of reducing childhood mortality rate by two thirds by 2015. The strategies to promote child health and survival within the Malawi health system and the broader multi-sectoral context have been briefly described under the overarching Accelerated Childhood Survival and Development (ACSD) efforts.

The chapter has also demonstrated that despite these significant gains, various challenges remain. Some of these challenges include: inequity in access to and utilisation of health services; stagnating or marginal improvements in some child health indicators; lack of harmonisation in delivery of child health services hence competing for the already limited resources; limited or no focus on some key determinants of child health and lack of care seeking.

Using the WHO six building blocks health system framework, this chapter has demonstrated that the Malawi health system has witnessed significant improvements due to health sector reforms implemented over the years. Notwithstanding, key challenges have been noted in almost all dimensions of the health system, the salient ones being: some poor health indicators; inadequate and inequitable human resources; inadequate and in some ways inefficient allocation of financial resources; inequity in access and utilisation of health services, lack of reliable and timely health information, and lack of essential medicines and supplies.

CHAPTER 3

URBANISATION, ACCESS TO CHILD HEALTH SERVICES AND DETERMINANTS OF CHILD HEALTH CARE SEEKING BEHAVIOUR

3.1 Introduction

This chapter reviews literature pertaining to two distinct but related themes of the study. The first part pertains to aspects of urban health specifically highlighting: the state of urbanisation in the global, regional and local contexts; definition of the slum concept; and urbanisation and urban residence as determinants of health. Literature around the urban health advantage and assertions around the declining trends of the urban health advantage is also highlighted in this part. The second part reviews literature on health care seeking behaviour, particularly for child health services. It highlights evidence regarding access to health care services as a crucial determinant of child health, followed by a review of evidence pertaining to determinants of child health care seeking decisions.

3.2 Literature search strategy

Review of literature for this PhD research used a systematic approach that involved various processes that included: reviewing papers from peer reviewed journals, books, chapters in books, government reports and policy documents, searching websites of some relevant multilateral organisations such as UNICEF and WHO. Literature search was performed in the following databases: PUBMED, CINAHL, Scopus and Web of Knowledge; and Google Scholar search engine. The following key phrases were used for articles related to urban health: "urbanisation" "urban health" "urban slums" "informal settlement" "urbanicity" "squatters" "peri-urban areas" "shanty towns" "urban outskirts". Key phrases for child health care seeking behaviour included "health care seeking behaviour" "health use" "health utilisation" "treatment seeking" "care giver" "care taker" "female autonomy" "social capital" and "maternal education". These key phrases were combined with words referring to children in child health literature including: "under five children" "childhood illnesses" "infant" "child survival" "child health" "neonates". Titles and abstracts were screened for relevance to the two topics. Reference lists from identified relevant papers were also screened to check for relevant literature on the subject matter, after which direct searches were conducted in the

sources mentioned above. An example of the search output from PubMed using key search words and combinations above is presented in table 3.1 below

Table 3.1: PubMed search results using some key search words

Searched	Found
Health care seeking	18435
Health service utilisation	3515
Health care seeking behaviour	164740
Under-five children	2130
Urban slum	3512
Determinants of care seeking	545
Health care seeking behaviour AND under-five children	104
Health care seeking behaviour AND under-five children AND urban slum	3
Urban slum AND health service utilisation	316
Urban slum AND health service utilisation AND under-five children	6
Urban slum AND child health	1077
Urban slum AND child health and survival	120

While there is considerable literature on urbanisation, urban health, and child health seeking practices as two distinct topical areas, there is a relatively small body of literature that focuses on child health and child health care seeking practices in urban slum settings. As such, the subsequent sections will draw evidence following this trend, but as much as possible provide available literature within the context of this PhD research.

3.3 Urbanisation, urbanicity and health: an overview of status and relationships

Defining concepts related to urbanisation represent an entry point for reviewing the available literature. Urbanisation entails an increase in the proportion of the urban population relative to the total population of a country (Sheuya, 2008). Beyond population size, urbanisation is also commonly conceived as a *"change in size, density, and heterogeneity of cities"* (Vlahov and Galea, 2002; p 5). Urbanicity on the other hand is a term that refers to *"the presence of conditions that are particular to urban areas or present to a much greater extent than in non-urban areas"* (Vlahov and Galea, 2002; p 5).

Thus, while urbanisation is dynamic, urbanicity is rather static and reflects inherent characteristics of an urban environment which may be as a result of urbanisation or other factors. For example industrial pollution, congestion, motor vehicle accidents are predominantly an urban phenomenon hence are inherent in urbanicity. With this conceptual basis, subsequent sections will explore the extent and trends of urbanisation and provide evidence of the relationship between urbanicity (hereinafter referred to as urban environment) and health and trends in health indicators, particularly for under-five children.

3.3.1 Urbanisation trends and prospects: the global, regional and Malawi context.

The world is increasingly becoming urban. Globally, 2007 was the turning point at which more people were estimated to be living in the urban than rural areas. Furthermore, according to United Nations population projections, by 2030 more people in the developing regions will be living in urban than rural areas (UN-HABITAT, 2012, UN-HABITAT, 2008). It is estimated that by the year 2030, the world urban population will increase by 2 billion and the rural population will decline by 20 million (UNDP., 2003). Furthermore, the highest urbanisation rates occur in the developing region to the extent that of the 5 billion people that are projected to be urban residents in 2030, 4 billion (80%) will be in the developing regions of Africa and Asia (UNFPA, 2005).

The annual rate of population growth in urban areas of developing countries between 2000 and 2030 is estimated to be averaging 2.4%, at which rate urban population would double in about 29 years. On the other hand, rural areas of developing countries will experience an annual population growth rate of only 0.02%. In contrast, developed countries' urban population annual growth rate over almost the same period (2000 to 2025) is estimated to be 0.41% (Baqui, 2009).

Urbanisation started more than two hundred and fifty years ago in the developed world and was triggered by the industrial revolution that characterised economic growth (Sclar et al., 2005, Sheuya, 2008). During this period, people moved into urban areas in search of jobs. Moreover, recent evidence suggests a positive link between economic productivity and urbanisation in high and middle income countries suggesting a healthy urbanisation (UN-HABITAT 2013).

In contrast, urbanisation in the developing world has been a mixed trend mainly characterised by low to medium economic growth rates or in some cases stagnating economies, urban poverty and the emergence of urban slums (Sclar et al., 2005, Sheuya, 2008, UN-HABITAT, 2012). Evidently, whereas the urban population grew by 4.7% per year in sub-Saharan Africa between 1980 and 2000, its per capita Gross Domestic Product over the same period declined by 0.8% annually (Fotso, 2007).

Various urbanisation rates have been quoted for Malawi in recent years. For instance, while some indicate an annual urbanisation rate of 4.8% (Chome, 2007), others have cited 6.4% (UN-HABITAT, 2010b). Nonetheless, it is consented to that Malawi has one of the highest urbanisation rates in the world (Chome, 2007, UN-HABITAT, 2010). In 1950, the urban residents constituted 3.5% of the Malawi population. By the time Malawi gained independence in around 1964, urban residents were 4.9% and in the early 1990s urban residents were approximately 11% of the population. In 2015, about 17% of the Malawi population is projected to be urban based and by 2030, the urban proportion will increase to about a quarter of the national population (UNDP, 2012). According to estimates by the United Nations and National Statistics Office, between 2010 and 2015 the annual population growth rate is estimated to be 2.7% (NSO, 2009, UNDP, 2012). However, the urban population growth rate over the same period is almost double the annual population growth rate at 4.8%, affirming the assertion of high urbanisation rate.

The reasons attributable to the high urbanisation rates in Malawi are similar to global determinants of urbanisation and include (Chome, 2007, Baqui, 2009):

- *Natural growth* whereby the existing urban population grows as a result of a high Rate of Natural Increase (RNI) (the difference between crude death rate and crude birth rate). Globally, 60% of urbanisation is attributed to this natural increase while in Africa it is estimated to be responsible for about 75% of urbanisation. Evidently, in Malawi the high total fertility rate for urban women, at 4.0, even though lower than for rural women (at 6.1) (NSO and ICF-Macro, 2011) contributes to the increasing urban population.
- *Internal rural-to-urban migration* which entails people migrating from rural to urban areas within the country. It is estimated that this is the second most significant

determinant of urbanisation as about 40% of urbanisation can be attributed to this factor, globally. In Malawi, the so called 'rural push' is a significant factor contributing to urbanisation. Recent estimates indicate that rural to urban migration accounts for 54% of total migration (NSO, 2012). People migrate from rural to urban areas due to reasons such as: limited cultivable land in rural areas, lack of rural off-farm economic activities, environmental degradation resulting in inability to perform some of the conventional livelihood activities, and escaping rural poverty and the perception of a better life in the cities (Chome, 2007).

- *International urban migration* which relates to people moving from urban areas from one country to the other for different reasons. This type of migration has also happened but has accounted for only about 1% of the total migration in Malawi (NSO, 2012).
- *Reclassification of urban boundaries encompassing formerly rural areas* thereby increasing the urban population count by new geographical demarcations for administrative or developmental reasons. The move of Malawi's capital city from Zomba to Lilongwe in 1975 may be classified into this reason but there has been no urban reclassification in the recent past.

While urbanisation has its advantages, it is acknowledged that rapid urbanisation, especially in the context of inappropriate urban planning and widespread poverty, leads to formation of slums in the urban areas (Baqui, 2009, KNUS, 2008, UN-HABITAT, 2010).

3.3.2 Defining an urban slum

Urban slums are multidimensional and classification of an area as a slum may be complex and sometimes relative. Moreover urban slums have been referred to with various terms in various contexts due to political or other reasons (Sheuya, 2008). The salient terms in literature include: informal settlements, shanty towns, squatters, ghettos, and peri-urban areas. This notwithstanding, discussions relating to definition of an urban slum (or its alternative terms) have focussed on eight facets namely: lack of basic services; substandard housing or illegal and inadequate building structures; overcrowding and high population density; unhealthful living conditions and hazardous locations; insecure tenure; irregular or informal settlements; poverty and social exclusion; and minimum settlement size (Sheuya, 2008, UN-HABITAT, 2003).

However, in response to the need for a quantitative measure of slums globally, a United Nations Expert Meeting in 2002, came up with an operational definition of an urban slum that it

> "Combines, to various extents, the following characteristics (restricted to the physical and legal characteristics of the settlement): inadequate access to safe water; inadequate access to sanitation and other infrastructure; poor structural quality of housing; overcrowding; insecure residential status." (UN-HABITAT, 2003, p 11).

In its State of the World Cities Report of 2006/2007, the UN-HABITAT modified the definition to entail that:

> "A slum household is a group of individuals living under the same roof in an urban area who lack *one or more* of the following five conditions: access to improved water, access to sanitation, durable housing, sufficient living area, and secure tenure" (UN-HABITAT, 2006, p 21).

The Knowledge Network on Urban Settings of the WHO's Commission in Social Determinants of Health acknowledges that despite the slum definition by the UN-HABITAT, there are numerous other interpretations (CSDH, 2008). Nonetheless, on the basis of the cited definition, by 2003, the United Nations estimated that a third of the 3 billion global urban population lived under slum conditions (UN-HABITAT, 2003) and in many countries in sub-Sahara Africa, the slum incidence was more than 50% (CSDH, 2008). In Malawi, 61% of the urban population was estimated to be living under slum conditions in 2010, (UN-HABITAT, 2010) with a slum growth rate at 4% which is almost at par with Malawi's urbanisation rate of 4.8% (Chome, 2007, UN-HABITAT, 2010).

3.3.3 Urbanisation and urban environment as determinants of health

The Knowledge Network on Urban Setting posits that urbanisation in itself is a structural social determinant of health (CSDH, 2008) as its context provides for risk to health or opportunities for better health. Moreover, Harpham and Molyneux, (2001), argue that epidemiological transition (a shift from predominance of communicable to non-communicable diseases) first occurs in urban areas. Various factors in the urban environment interact to produce health or

ill-health. Four broad categories of urban living conditions have been cited as determinants of urban health namely: population composition; physical environment, social environment and health and social services (Vlahov et al., 2007).

Population composition: Vlahov et al. (2007) argue that the composition of an urban population such as gender, age, cultural and genetic characteristics mean that the urban population have particular health resiliencies and vulnerabilities. They further argue that while acknowledging the diversity of an urban population where there is no specific urban genotype, a change in population over time due to urbanisation means that '*the genetic characteristics interact with urban environmental conditions resulting in an urban phenotype that has particular vulnerabilities and resiliencies*' (p 19) to ill health.

Physical environment: This category is one of the most documented determinants of health pertaining to urban health. Physical environment features such as access (or lack of it) to safe water, sanitation technologies; refuse disposal, and road safety have been discussed as important determinants of urban health (Harpham and Molyneux, 2001, Vlahov et al., 2007).

Evidently, prior to the public health revolution in Europe, urban health indicators were poor, characterised by a life expectancy of below 30 years and high rates of disease transmission and childhood mortality (Garenne, 2003). In contrast after the public health revolution which was characterised by good sanitation technologies, provision of safe water, better housing with improved ventilation; the health of urban residents significantly improved (Garenne, 2003). The same improved conditions are prevalent in the modern day urban environment in many countries albeit acknowledging that urban slums are mostly characterised by lack of access to safe water, proper housing, improper refuse disposal, overcrowding and sanitation technologies among other key environmental features (Fotso, 2007). These pose significant health risks for slum residents in general and particularly for vulnerable population groups such as children under the age of five years (Gould, 1998).

Various epidemiological studies have been conducted signalling the urban physical environment as a determinant of health. For example, a study in Ethiopia found a higher reported prevalence of asthma like and atopy symptoms among urban than rural populations and suggested urban conditions as attributable factors for the difference (Haile et al., 1997). Risk for injury due to homicide, road traffic accidents, and lifestyle diseases such as heart

conditions, have been reported to be more prevalent in urban than in rural areas (Harpham and Molyneux, 2001) because the urban environment context presents such risk factors. The constant outbreaks of cholera and other epidemics including high prevalence of child diarrhoea have also been reported in slum areas as a consequence of the risks posed by the environment (Fotso, 2007, Taffa and Chepngeno, 2005).

The social environment. The city's social environment is a determinant of health through various pathways which can ultimately be positive or deleterious. For example, many support organisations can be existent in an urban setting providing support to individuals and groups that can buffer stressors of urban living hence positively impacting on individual's health (Vlahov et al., 2007). However, Shetty (2011) argues that the urban poor and slum dwellers may not have access to programmes run by Non-Governmental Organisations (NGOs) and governments hence limiting their supportive environment to some extent.

Conversely elements of social support can result in damaging health behaviour such as gang membership, social pressures for alcohol and other psychoactive substance abuse that are characteristic of, or are more frequently used by urban residents (Omoluabi, 1995, Vlahov et al., 2007). Social capital has also been shown to decline in urban settings especially among rural to urban migrants hence affecting child and adult health in their households (Cassell et al., 2006). Other studies have reported social exclusion that ultimately affects mental health and access to health and other social services especially among the urban poor and slum residents (Harpham, 1994, Garenne, 2003, KNUS, 2008).

Health and social services. In many countries, cities are often characterised by availability of multiple health and social infrastructure and services. This entails that urban residents, potentially have better access to health and other social services due to proximity relative to their rural counterparts (Vlahov et al., 2007). This notwithstanding, arguments are abound that the urban poor and those residing in slums may not have access to quality health and other social services relative to other urban areas (Shetty, 2011, Sheuya, 2008, Vlahov et al., 2007, Vlahov and Galea, 2002). In any case, the presence of health and social services influences child and adult health in an urban setting.

Urban governance structures. In this case urban governance structures refers to a general term that encompasses government role and the interactions with civil society, structural set

up of municipals and various regulations that affect urban living. An extensive literature has demonstrated that good governance is an important determinant of health (Vlahov et al., 2007). On the other hand, it has been argued that poor municipal governance may be responsible for formation of urban slums (Vlahov et al., 2004).

Government policies in health or its social determinants such as housing, public transportation, social welfare, criminal justice, access to education may promote or damage health depending on how they are developed and implemented (Vlahov et al., 2007, Vlahov and Galea, 2002). With specific reference to urban slums, government policy on 'illegality' of slums may affect municipal programmes for health and social services thereby determining access to safe water, electricity and emergency health services for children and adults (Vlahov et al., 2007). Precisely, urban governance determines priorities and subsequent financing for health and social services which directly impact on the health of the urban population

3.4 Is the urban health advantage declining? A global perspective.

Health indicators are on average better in urban than rural areas (Anyamele, 2009, Sheuya, 2008, KNUS, 2008, Garenne, 2003). In Malawi, for example, under five mortality rate was 164 compared to 116 per 1000 live births for rural and urban residents respectively in 2004, and 130 compared to 113 per 1000 live births for rural and urban residents in 2010 (NSO and ICF-Macro, 2011, NSO and ICF-Macro, 2005). Other child health indicators generally reflect this trend of an urban advantage in many developing countries (Garenne, 2003, Anyamele, 2009). An analysis of under-five child mortality data in resource poor settings by Garenne (2010) noted a declining trend of child mortality in many countries, mostly with an urban advantage.

In the period between 1950 – 2000, under five child mortality is said to have declined by 57% in both urban and rural areas (Garenne, 2010). However, over the same period, according to Demographic and Health Surveys, urban mortality patterns in Africa, Asia and Latin America were reported to be 25% lower than rural mortality albeit acknowledging country variations in the urban-rural divide (Garenne and Gakusi, 2006, Garenne, 2010). For example, in Senegal, rural mortality was noted to be twice that of urban areas (Antoine and Diouf, 1988 in Garenne, 2010), in Botswana there were almost similar urban and rural mortality levels while in Trinidad and Tobago a higher urban mortality was noted (Garenne, 2010).

Historically, in many countries in Europe, prior to and in the early stages of industrialisation, health indicators in urban areas were worse off than in rural areas. For example, evidence suggests that in the 19th century, infant mortality in urban areas in England and Wales were 2.2 times higher than in rural areas (Garenne, 2003). With prevailing circumstances as these, Garenne and Gakusi (2006) argued that the urban population could easily have been wiped out if it were not for high levels of in-migration.

The term *'urban penalty'* was prompted due to this phenomenon of worse health status of urban residents (Freudenberg et al., 2005, Harpham, 2009). However, over the years, the public health revolution characterised by: improved sanitation, access to safe water; vaccinations; improved housing conditions led to improvements in urban health indicators to the extent that they became better than rural areas (Garrene, 2003, Harpham and Molyneux, 2001). This health transition has gone on for a few decades and the urban areas have enjoyed a health advantage over the rural areas leading to a phenomenon that has been termed the *'urban advantage'* (Harpham, 2009).

However, for about three decades now, since the urban health discourse has received some prominence, many have argued that aggregate urban-rural comparisons suggesting an urban advantage are misleading considering that the urban population is not homogeneous (Garrene, 2003, Fotso, 2007, Harpham, 2009). Further to this argument, literature discourse has suggested that some population groups in urban areas face similar levels of health disadvantage or in some cases actually face worse health outcomes than the rural areas (APHRC, 2002, Garenne, 2003, KNUS, 2008, Harpham, 2009). The African Population and Health Research Centre has demonstrated, through its study of Nairobi slums, that child mortality in these slums is much higher than the rural areas of Kenya and the national average (APHRC, 2002).

With such evidence in mind, the key question for public health in urban setting is therefore whether there is any evidence of an emerging urban penalty or whether the urban advantage is declining. Using data from Demographic and Health Surveys (DHS) from sub-Saharan Africa, Garenne (2003) found that under-five child mortality *"...declined faster in urban areas until 1980, but then tended to stagnate, whereas it continued to decrease steadily in rural areas"* (p 5).

Evidently, Garenne (2003) investigated trends in urban and rural mortality by reconstructing yearly mortality estimates from Welfare Monitoring Surveys (WMS) and DHS data from some sub-Saharan African countries which included Malawi in the periods from early 1970s to the late 1990s. The results, while generally affirming the declining trend in child mortality in both urban and rural settings, revealed divergent urban and rural phenomenon with regard to child mortality trends. It was noted that in some countries such as Burkina Faso, Rwanda, Senegal, Togo and Uganda, mortality decline was faster in rural areas effectively narrowing the rural-urban gap. In Benin, urban mortality had stagnated while it continued declining in rural areas also reducing the rural-urban gap. In Malawi, Zambia, Zimbabwe and Burundi, the rural-urban gap was reduced due to rising mortality in urban areas. In cases where the rural-urban gap had increased due to a faster mortality decline in urban areas such as Niger and Mozambique, the situation was reversed with data of the late 1990s.

A similar analysis was conducted by Fotso (2007) using DHS data to determine trends in urban-rural differentials of malnutrition among children aged 1 to 35 months for fifteen sub-Saharan African countries. The results indicate a general decline in urban advantage in eight of the fifteen countries albeit with statistical significance in only two of these, no change in urban-rural differentials in four countries and an increasing urban-rural gap in three of the countries. An increase in urban malnutrition was attributable to the declining urban advantage in some countries whereas a faster declining rate of urban malnutrition was responsible for widening urban-rural gap in others. Likewise, Gould (1998) argues that a worsening of urban health levels, due to among other reasons, the pervasive socioeconomic inequalities, has led to the narrowing of the urban-rural health gap.

Furthermore, Haddad et al. (1999) in their analysis of childhood nutrition indicators of sixteen countries including Malawi, using nationally representative surveys found that the absolute number of underweight children in urban areas was increasing and at a faster rate than that occurring in rural areas. Moreover, an increasing proportion of underweight children within urban areas (Haddad et al 1999), further renders weight to the argument of worsening urban health in other settings consequently contributing to a declining urban health advantage.

Consequently, Garenne (2010) attributes three salient reasons to this phenomenon, which in aggregate terms relate to determinants of urban health and they include: extreme urban

poverty in some areas of the urban such as the urban slums often due to lack of state interventions; emerging diseases such as HIV and AIDS that have affected the urban areas more, especially in the pre-HAART (Highly Active Anti-retroviral Therapy, including Prevention of Mother To Child Transmission) era; and heightening risk of some diseases such as respiratory infections resulting from air and chemical pollution in cities. Other authors have provided these reasons for similar findings (Fay et al., 2005, Fotso, 2007).

In contrast, another analysis of Demographic and Health Surveys data by Montgomery and Hewett (2005) noted advantage status of urban children in nutritional indicators of height and weight for age and posited that there is no erosion of the urban health advantage for these indicators. Thus, the evidence for a declining urban health advantage notwithstanding, according to Harpham (2009) there is little good trend data for definitive conclusions on the *emergence of an urban penalty* but there has been some evidence pointing to the worsening health of the urban poor. Some authors have since argued that this worsening health of some population groups within urban areas is leading to a decline in the extent of urban health advantage relative to the rural areas (Garenne, 2010, Gould, 1998). Precisely, addressing the question of whether there is an emerging urban penalty or a declining state of urban health, Gould (1998, p 179) posits:

> "Without urgent and substantial commitment to urban improvement in the public domain and in the domestic domain, and by international donors and agencies as well as by national governments – there really might then be a serious threat of an urban penalty emerging in Africa within the next decade, and particularly for the rapidly growing mass of the urban poor."

In the context of slow economic growth and increasing urbanisation rates, Harpham (2009) points to an analytical refinement to the urban health advantage discourse towards a focus on how different health indicators may relate differently to urbanisation. The work of Fay et al. (2005) renders evidence to this viewpoint. Fay et al. (2005) analysed DHS data from 39 developing countries and noted that child stunting declined with increasing urbanisation but child mortality increased even in the context of better access to health care and infrastructure in urban settings.

Another thread of argument that lies through the declining urban advantage health debate and is regarded as a policy imperative in literature discourse relates to pervasive inequalities within the urban setting. This, as some authors have argued is one reason for stagnation of urban child health indicators in some countries (Gould, 1998, Fotso, 2007, Harpham, 2009, Garenne, 2010). An analysis of DHS data for sixteen countries in Africa by Fotso (2006) found a greater magnitude of within urban differentials in child malnutrition and socioeconomic status than rural-urban differentials.

Similarly, Timaeus and Lush (1995) in their comparative analysis of child mortality differentials using DHS data for urban areas of Ghana, Egypt, Brazil and Thailand noted that children of urban poor experienced higher mortality than their counterparts from higher socioeconomic status households in all countries albeit with varying extent of differentials across the four countries.

Other studies have similarly reported substantial heterogeneity of the urban compared to rural settings and the disadvantage of the urban poor pertaining to health (Haddad et al., 1999, Menon, 2000, Montgomery and Hewett, 2005, Zere and McIntyre, 2003). Evans and Peter (2001) have argued that health inequities emerge from and can be defined in three dimensions of: differential exposure; differential vulnerabilities and differential outcomes. Arguably, the pervasive inequities in access to health enhancing resources within the urban context contribute to inequities in health outcomes and a consequent decline of overall urban health indicators.

3.5 An overview of strategies to improve urban health and respond to the urban slum health challenges

The recognition of context specific challenges of urbanisation and urban residence on population health led to conceptualisation of different implementation models to improve the health of urban populations. In recent decades, the healthy settings movement and the urban slum upgrading programmes represent two key strategies in this regard.

3.5.1 The healthy settings movement

The healthy settings movement emerged from the Ottawa Charter of 1986 which declared that *"Health is created and lived by people within the settings of their everyday life; where they learn, work, play and live"* (WHO, 1986). The overarching philosophy of the healthy

settings approach entails improving health by acting on its determinants. This approach has gained prominence in recent years (Dooris, 2006) and has been implemented in various settings. One of the key healthy settings approach is the healthy cities movement. In its design, the Healthy Cities movement promotes comprehensive and systematic policy and planning for health and emphasizes the following four tenets: (i) the need to address inequality in health and urban poverty; (ii) the needs of vulnerable groups; (iii) participatory governance; and (iv) the social, economic and environmental determinants of health (WHO, 2013).

The Healthy cities approach has however been more prominent in the WHO European region where more than 1400 cities and towns are members and in the Americas. More recently, healthy settings approach at municipality, village, school, workplace levels are being advocated by WHO in all its regions (WHO, 2013). At the centre of the healthy settings approach are dimensions of inter-sectoral collaboration considering that improvements in population health go beyond efforts of the health sector; and participatory action to ensure sustainability of actions (Wadell, 2005).

The healthy cities or broadly healthy settings approach are consistent with the logical model developed by Freudenberg et al. (2005) to understand and improve population health in urban settings. Building on ecological models, Freudenberg et al. (2005) argue that urban living conditions present the context or setting within which various remediable factors determine individual and population health. These urban conditions include: physical environment; social environment; health and social services systems; and characteristics of urban populations (such as demographics; behaviour; and beliefs). Understanding that urban health is determined by interaction of these factors in its settings would lead to identifying those factors that influence health thereby designing strategies to address them within the urban setting (Freudenberg et al., 2005).

In spite of the wide acceptance of healthy settings approach including the healthy cities movement, criticisms exist on the lack of robust evidence on its effectiveness. In this regard, St Ledger (1997) argues in Dooris (2006, p 3): "*The settings approach has been legitimated more through an act of faith than through rigorous research and evaluation studies...much more attention needs to be given to building the evidence and learning from it*". However,

more recently the WHO has argued that while there have been no systematic reviews to synthesise evidence on effectiveness of healthy settings approach such as healthy cities movement, various evaluations have provided evidence of their benefits (KNUS, 2008).

3.5.2 Participatory Slum Upgrading Programmes (PSUP)

The concept of slum upgrading programmes was originally advocated in the 1970s by John Turner. In early stages of conceptualisation, slum upgrading programmes basically entailed improving the physical environment of the existing area, for example, improving the infrastructure like water, sanitation, refuse collection, street lighting, access roads, footpaths and drainage system (Turley et al., 2013). With passage of time the concept has evolved to include other aspects such as social, environmental, organisational and economic interventions (Wekesa, 2011 in Turley et al., 2013).

More recently, Participatory Slum Upgrading Programmes (PSUP) are being advocated by the UN-HABITAT with an aim of responding to urbanisation and the dynamic urban and slum environments including reduction of poverty (UN-HABITAT, 2009). The PSUP started in 2008 and is being implemented in African Caribbean and Pacific (ACP) countries which habit 90% of the world's slums (UNHABITAT, 2009). Malawi is one of the countries whose four cities are participating in the PSUP. Like the healthy settings approach that includes the healthy cities movement, inter-sectoral collaboration is integral to implementation of PSUP as many actors and sectors are involved in this complex intervention (UN-HABITAT, 2009).

Clearly, the PSUP objective entails improving the urban slum conditions hence its objective is not primarily health. However, considering that health and social services feature in the components of the PSUP and that its scope is acting on social determinants of health, the relevance to improving population health in general and that of children appears straightforward. The UN-HABITAT PSUP approach entails three steps namely: urban profiling, participatory urban planning and project design, and project implementation.

In the urban profiling phase, the intention is to undertake mapping of the urban setting to identify: challenges and responses to increased urbanisation of poverty, gain an overview of the cross-sector urban governance including bottlenecks hindering equal opportunity, and prioritising problems and solutions. In the UN-HABITAT approach the main themes analysed are urban governance, urban safety, shelter, land, gender, local economic development, basic

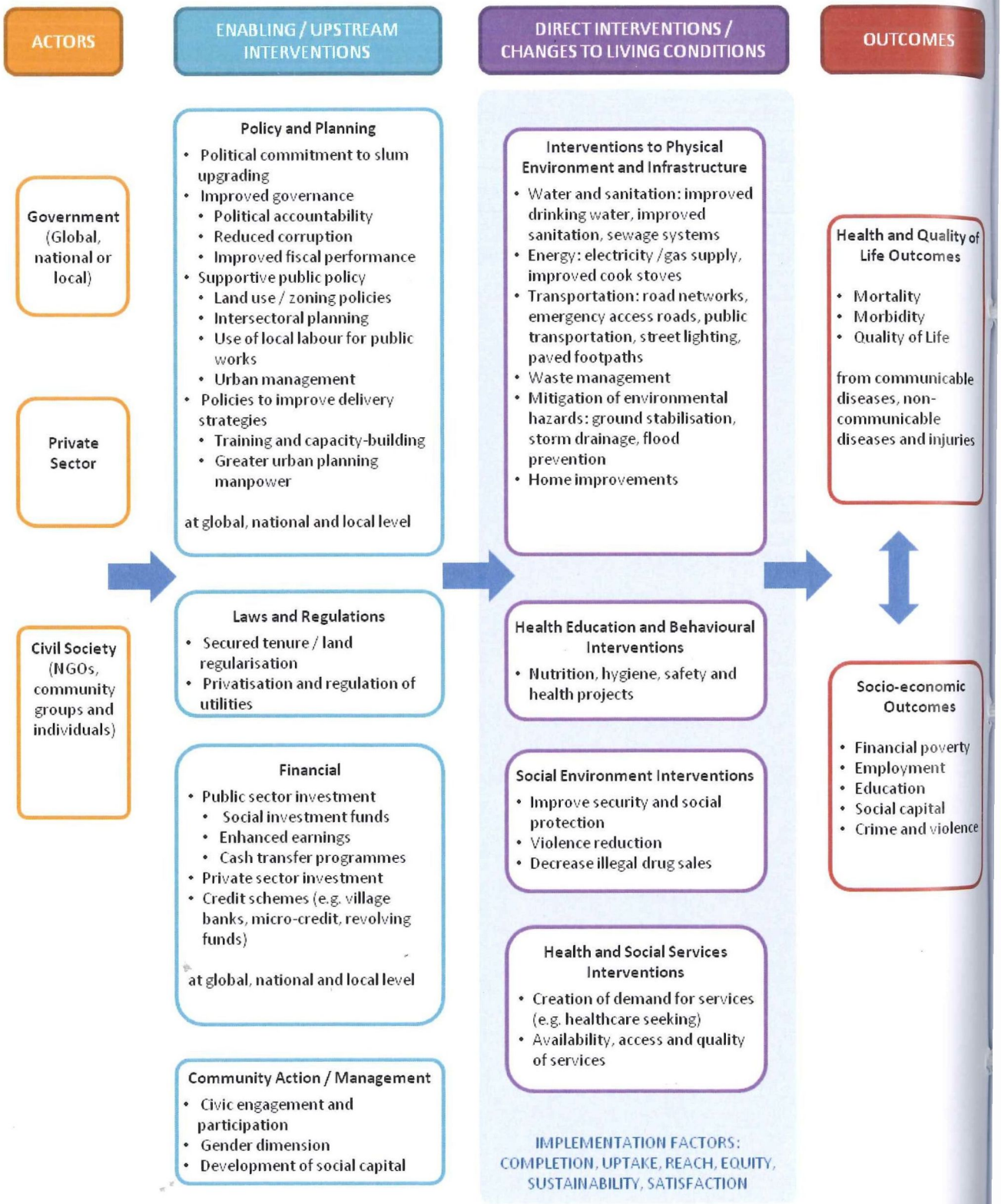
urban services including health and social services, disaster management and environment (UN-HABITAT, 2011).

In the second phase information solicited from the first phase is used for programme planning in a participatory manner. Various stakeholders are identified and involved in action planning and typically main actors include: urban governance structure such as city council, UN-HABITAT, funding partners, low income community groups, academia, Non-Governmental Organisations, and various sectors of Government (UN-HABITAT, 2011).

The third phase involves implementation of the programme in a participatory manner. Inter-sectoral collaboration and strengthening of local urban governance structures to undertake the coordination role are key in the process.

A typology of the PSUP has been provided by Turley et al. (2013) with ultimate outcomes being health and socioeconomic indicators. Figure 3.1 below illustrates the logic model of the slum upgrading programme as partly presented above

Figure 3.1: Logic model of Participatory Slum Upgrading Programme



Source: Turley et al. (2013).

In its basic form therefore, the logic model illustrates that design and implementation of the PSUP entails collective efforts of various actors at different levels acting to implement various actions to improve the urban slum living conditions (from policy to implementation) which

should ultimately result in improving health and socioeconomic outcomes. In many ways, the concept of PSUP is similar to the healthy settings approach as its activities are meant to improve urban slum settings to promote health and wellbeing of urban slum residents.

However, evidence on the effectiveness of PSUP has however been mixed. A systematic review by Turley et al. (2013) on the effects of slum upgrading programmes involving the physical environment concluded that there was limited but consistent body of evidence suggesting reduction in morbidity of communicable diseases such as diarrhoea and other waterborne diseases.

3.6 Responding to burden of childhood illnesses through access to health care.

In recent years, largely due to the need to monitor progress towards attainment of MDG 4, considerable attention has been placed on tracking childhood morbidity and mortality patterns and coverage of child health interventions. High level committees have been set up at global level to provide epidemiological evidence on child health and inform child health programming. In particular, the United Nations Inter-agency Group on Estimation of Child Mortality, the Child Health Epidemiology Reference Group (CHERG), the Global Burden of Disease Project (GBDP), the Bellagio Child Survival Review Group; the Lancet Child Survival Series have been instrumental in providing child health epidemiological and health service information to inform health policy and practice (Bryce et al., 2013, CHERG, 2009, UNICEF, 2012). Indeed it is important that any programming of child health interventions should begin by understanding the epidemiological patterns and then analyse access to health care and other determinants of child health.

3.6.1 The global burden of childhood diseases.

The United Nations Children Fund (UNICEF) estimated that, globally, 10.8 million under-five children died in the year 2000. The sub-Sahara Africa region contributed approximately 41% of this global under-five child mortality, registering the highest mortality burden (Black et al., 2003). Over the years, significant improvements have been made pertaining to reduction in under-five mortality. Notably, recent estimates suggest that there has been a decline in the global number of under-five deaths from about 12 million per year in 1990 to about 6.9 million per year by 2011. Furthermore, there has been an accelerated annual rate of reduction in

under five mortality globally, from 1.8% over 1990-2000 to 3.2% over 2000-2011 (UNICEF, 2012).

Despite these improvements, recent estimates indicate that the sub-Sahara Africa region still has the greatest burden of under-five mortality, with about 50% of the global burden, and where 1 child in 9 dies before the age of five. Its under-five mortality rate is more than 16 times higher than the average under-five mortality in the developed regions (UNICEF et al., 2012). It is also the region, along with South Asia, where progress towards attainment of MDG 4 (reduction of under-five mortality by three quarters by 2015 from the 1990 levels) is lagging behind (UNICEF, 2012).

According to Liu et al. (2012) and Jones et al. (2003), almost two thirds of child deaths are due to infectious diseases such as pneumonia, malaria, diarrhoea and HIV and AIDS. On the other hand, the United Nations Inter-agency Group for Child Mortality Estimation reports that pneumonia (18%) preterm birth complications (14%); diarrhoea (11%); intra-partum related complications (9%); and malaria (7%) account for the commonest causes of mortality for children under the age of five while more than a third of under-five deaths are attributable to under-nutrition (UNICEF et al., 2012).

As demonstrated earlier in the burden of childhood diseases in Malawi, pneumonia (22%), neonatal causes (22%), diarrhoea (18%), malaria (14%), HIV and AIDS related (14%) account for the commonest causes of mortality among under-five children (GOM, 2008). Compared to the global burden, a similar pattern can be noticed with the exception of HIV and AIDS related causes which account for a far greater burden than the global level.

These diseases are largely amenable to currently available preventive and curative measures (Black et al., 2003). However, it is admitted that while cost effective interventions are available to prevent child deaths, coverage of these interventions remains low in many countries with the highest child morbidity and mortality levels (Jones et al., 2003). In their systematic review of evidence on effectiveness of interventions for commonest causes of childhood morbidity and mortality, Jones et al. (2003) cited a range of preventive and curative interventions with varying degrees of evidence of effect. Table 3.1 below reflect the interventions, the childhood conditions they address and their corresponding coverage in 42 countries that contribute 90% to the global under-five child mortality burden.

Table 3.2: Evidence based interventions for commonest causes of childhood morbidity and mortality

Intervention	Cause of Under-five child death	Mean coverage of target population[b]
Preventive Interventions		
Breastfeeding[a]	Diarrhoea, pneumonia and neonatal sepsis	39%
Insecticide treated materials e.g. ITNs	Malaria and preterm delivery	2%
Complementary feeding (continued breast feeding 6-11 months)	Diarrhoea, pneumonia, measles and malaria	90%
Water, sanitation and hygiene	Diarrhoea	47%
Haemophillus Influenza B vaccine	Pneumonia	1%
Zinc	Diarrhoea, pneumonia and malaria*	0%
Vitamin A supplementation	Diarrhoea, measles* and malaria*	55%
Antenatal steroids	Preterm delivery	5%
New born temperature management (prevention and management of hypothermia)	Preterm delivery	20%
Tetanus Toxoid Vaccine	Neonatal tetanus	49%
Nevirapine and replacement feeding	HIV and AIDS	5%
Antibiotics for premature rapture of membranes	Preterm delivery and neonatal sepsis	10%
Clean delivery	Neonatal tetanus and neonatal sepsis	54%
Measles vaccine	Measles	68%
Intermittent Preventive Treatment of malaria during pregnancy	Preterm delivery	1%
Treatment Interventions		
Oral Rehydration Therapy (ORT)	Diarrhoea	20%
Antibiotics for pneumonia	Pneumonia	40%
Anti-malarials	Malaria	29%
Antibiotics for sepsis	Neonatal sepsis	10%
New born resuscitation	Birth asphyxia*	3%
Antibiotics for dysentery	Diarrhoea	30%
Zinc	Diarrhoea	0%
Vitamin A	Measles	55%

Note: * indicates insufficient evidence on effectiveness of intervention on childhood disease condition

[a] Exclusive breastfeeding for the first six months and continued breast feeding from 6 to 11 months.

[b] Mean estimated coverage of target populations based on State of the World Children report data 2003

Source: Jones et al, (2003).

Estimates from the table above, being based on data from early 2000s, may have changed in recent years in many countries. For example, in Malawi, Zinc has only been introduced as

standard treatment for diarrhoea within the past two years (GOM, 2013). In addition, recent evidence indicates that the original list of 16 preventive and eight treatment interventions for which there was evidence of effectiveness in addressing commonest causes of child morbidity and mortality has now expanded to 52 interventions (Bryce et al., 2013). Interventions such as Pneumococcal and rotavirus vaccines, use of chlorhexidine for umbilical cord care, Long Lasting Insecticide Treated Nets (LLITN), and rapid diagnostic tests for malaria are among the interventions added to the original list indicated in the Lancet Child Survival Series of 2003 (Bryce et al., 2013).

Evidently, Haines et al. (2007) estimated that with adequate coverage of current health care interventions, 41-72% of new born deaths can be prevented. Empirical, evidence from Jones et al. (2003) however asserts that globally, access to most effective child survival interventions in the early 2000s stood at only 50%, implying a wide gap to reaching universal coverage levels in order to reap optimal benefits of these interventions. Recent evidence portray the same picture. Evidently, in their projections of neonatal and under-five mortality to 2035, Walker et al. (2013) noted that based on historical trends of coverage of proven effective child health interventions, under-five child deaths per year would decrease from an estimated 7.6 million in 2010 to 5.4 million, representing a 28% decrease. However, if each country accelerates intervention coverage to the highest level attained by a country with similar baseline level (best performer scenario), under-five deaths would decrease to 2.3 million, registering a 71% decrease from the estimated under-five child deaths in 2010. This reflects that current coverage levels of proven effective child health interventions remains suboptimal, and by extension implies the need to increase access to child health interventions.

3.7 Access to health care as a determinant of child health

The concept of access has been defined in several ways and different frameworks exist to explain it, resulting in varying interpretations (Andersen, 1995, Gulliford et al., 2002, Rutherford et al., 2010, Penchansky and Thomas, 1981). Some authors have defined access as availability of health services while others have defined it more broadly encompassing the use of the available services (Andersen, 1995, Gulliford et al., 2002, Rutherford et al., 2010). In other words, the former view is concerned with making health services available hence providing an opportunity for those that may need health services to obtain them. However,

other authors have argued this view of access is limited in that people may have access to health services but face challenges to utilise them when in need (Gulliford et al., 2002). Proponents of the latter view have argued that there is need for this potential access to be realised. Consequently, access has been defined as *"a fit between those seeking health services and health services themselves and an ability to receive care when needed and desired"* (Rutherford et al., 2010; p 509). This viewpoint that considers utilisation as being integral to the access concept is predominantly used in current literature discourse on access to health care.

Additionally, some authors have argued that access has four dimensions namely (Chuma et al., 2009, Gulliford et al., 2002, Penchansky and Thomas, 1981, Rutherford et al., 2010): (i) geographical availability of health care services in relation to patient / client; (ii) affordability which entails the cost of care seeking and ability to cope with them; (iii) acceptability, implying the nature of service provision and how people perceive them; and (iv) adequacy, meaning how health services meet the demand and expectations of potential users.

Closely related to access, especially the broader four dimensional view point of access, is the term 'universal coverage' which has dominated health system discourse in recent years. Universal health coverage is defined as providing all people with access to needed health services of sufficient quality to be effective, and without financial hardships when paying for them (Moreno-Serra and Smith, 2012, Sachs, 2012, Savedoff et al., 2012) . It embodies access, equity, quality, effectiveness, cost and coverage of health services. While the definition entails health access for all people, Jones et al. (2003) in their study on child survival interventions defined universal coverage for children as reaching 99% (and in some cases 90%) of children with effective interventions.

The evidence that access to health care is a crucial determinant of health, including child health, has existed for some time and continues to emerge. The Health Systems Knowledge Network (HSKN) of the WHO's Commission on Social Determinants of Health (CSDH) attests that there is considerable conclusive evidence from epidemiological and econometric analyses that health systems promote population health even independent of other influences (HSKN, 2008).

Various other studies have demonstrated both the potential and tangible health systems influences on child health. A study by Jones et al. (2003) estimated that about two thirds of child deaths can be avoided if coverage of currently available effective preventive and therapeutic measures reached universal levels. Correspondingly, there is some evidence suggesting that improvements in health services contribute to significant mortality reduction. Evidence from Costa Rica indicates that improvements in primary level of health care resulted in reduction of infant mortality rate from 60/1000 in 1970 to 19/1000 in 1985. In addition, every five years afterwards, reductions of 13% and 4% for child and adult mortality respectively were achieved independent of improvements in other health determinants (HSKN, 2008). A study conducted in Beira city in Mozambique by Cutts et al. (1996) attributed a child mortality reduction from 246 to 154 deaths per 1000 live births over 1977 - 1991 to superior health services over the same period of time.

Similarly, significant child death reductions of 19% in Liberia and 32% in Zaire (present day Democratic Republic of Congo) were reported to coincide with intensive child health care programmes (Rutherford et al., 2010). In the same vein, Amarasiri de Silva et al. (2001), in their study of four districts implementing IMCI in rural Sri Lanka concluded that care seeking (including prompt care seeking in the event of childhood illness) was a plausible explanation for low childhood mortality.

In essence, on the basis of various studies and experiences, there seems to be consensus in literature discourse that health care is a crucial determinant of health in general and child health in particular (Armstrong Schellenberg et al., 2008, CSDH, 2008, Evans and Peter, 2001, Jones et al., 2003, Rutherford et al., 2010). The Commission on Social Determinants of Health alludes that '*health care systems are a vital determinant of health..... and offer benefits that go beyond treating and preventing illness especially when integrated with other services*'. In the same vein, Rutherford et al. (2010) asserts that '*improved access to essential treatment holds great potential for significant reduction in child deaths*' (p 508). The extent that health systems can influence health outcomes at an optimal level, however, depends on how they are organised and whether people utilise the services available to them. Precisely, understanding determinants of access to child health services is crucial to inform child health programming, if the health care system is to optimally influence child health.

3.8 Determinants of health care seeking for child health services

There is consensus that the health system is a vital proximate determinant of child health (Mosley and Chen, 1984, CSDH, 2008, Rutherford et al., 2010) implying that any goal to improve child health and survival embeds the need to ensure access to health services. However, there is considerable evidence in child health literature discourse of the marginal improvements, and in some cases, worsening child health indicators in the global context where interventions addressing the causes of childhood morbidity and mortality are available (Armstrong Schellenberg et al., 2008, Bryce et al., 2005, Claeson and Waldman, 2000, Haines et al., 2007, Jones et al., 2003, Pokhrel, 2006a). As Jones et al. (2003) argue, children continue to die because interventions are not reaching them.

Consequently, a body of knowledge has existed for some time and research continues to emerge pertaining to determinants of health care seeking for child health services, with a special interest in under-five year old children. Attributes of a health system such as: distance to health facilities; cost of health care; and personal and household attributes such as: social networks, care giver's autonomy; education, household wealth, child's age and illness factors have been cited as critical determinants of care seeking. The subsequent sections review literature evidence on these attributes as determinants of care seeking for child health services. Considering the study focus, to the extent possible, specific literature on urban residents, urban population and urban slums will be highlighted.

3.8.1 Distance to health facilities as determinant of health care seeking behaviour

While there is mixed evidence on the effect of distance to a health facility on impact level indicators of child health such as under-five mortality and infant mortality rates (Rutherford et al., 2010), there is substantial evidence pertaining to effects of distance on utilisation of child health services. Evidently, Schellenberg et al. (2008) found a significant relationship suggesting higher child mortality among households further from health facilities and Rutherford et al. (2009) did not find any relationship. In a systematic review of how access to health care determines child mortality in sub-Saharan Africa, Rutherford et al. (2010) conclude that there is need for more evidence from studies applying different robust methods and counteract limitations of previous studies on effect of distance to health facility on child mortality.

Nonetheless, a multi-country evaluation of Integrated Management of Childhood Illnesses (IMCI) concluded that proximity to health services is crucial to improve child health outcomes among high risk and poor populations (Bryce et al., 2005). Furthermore, there is consensus that distance to a health facility has an effect on use of child health services (Chuma et al., 2009, Ewing et al., 2011, Getahun et al., 2010, Melnyk, 1988, Mtango et al., 1992, Rutebemberwa et al., 2009, Rutherford et al., 2010).

Distance to a health facility has often been cited as a determinant of care seeking for child health services and health services in general by various authors and in different contexts (Rutherford et al., 2010, Taffa and Chepngeno, 2005, Tinuade et al., 2010, Gabrysch and Campbell, 2009, Melnyk, 1988, Rutebemberwa et al., 2009, Thaddeus and Maine, 1994). In a review of published research on barriers to health care, predominantly from studies in the 1970s to mid-1980s, Melnyk (1988) asserts that distance has proved to be a significant determinant of seeking health care services. While some discussions in the review relate distance to transportation cost and time spent seeking health services, it was generally regarded as a deterrent to health services (Melnyk, 1988). More recent systematic reviews on care seeking and determinants of access to child health care services have corroborated these findings (Chuma et al., 2009, Herbert et al., 2012, Rutherford et al., 2010) .

A study in eastern Uganda on determinants of delay in health care seeking for febrile children found a significant difference between care givers who perceived their distance to health facility to be a kilometre or less and those who perceived their distance to a health facility to be more than a kilometre (Rutebemberwa et al., 2009). Another study in Papua New Guinea found a significant effect of distance on attendance to a rural health centre for child and adult morbidity. In this study, it was found that distance decay at 3.5km accounted for 50% reduction in mean attendance at a health centre (Muller et al., 1998).

Some studies in the developed country context also found the effect of distance. In their study assessing attendance to an optional wellness programme for women, Oleson et al. (2008) found that distance to the point of intervention had an effect on participation in the intervention. An interaction between age of women was also noted with distance pertaining to participation in a wellness programme.

Another study in rural Bangladesh that focussed on the effect of distance, age and gender on attendance to a diarrhoea clinic for children and adults found that attendance decreased with increasing distance. In the study, over 90% of diarrhoea patients within a mile radius attended the clinic but the attendance rate dropped to 70% for males and 40% for females at 2 miles radius. Diarrhoea mortality was also found to be significantly associated with increasing distance from the clinic (Rahaman et al., 1982). Similar findings were noted in a study on utilisation of paediatric health services among febrile children in four districts in Kenya (Noor et al., 2003). In this study, utilisation of paediatric services reportedly declined as distance increased with major peaks noted at 2-3km distance and a turning point where rate of change of usage slowed was noted at 5-6km distance (Noor et al., 2003). In this Kenyan study, it was also found that 56% of paediatric patients used a health centre closest to them and that of those that did not use a nearest health centre, 65-74% used a farther distant health centre or a facility of higher level of care. The authors concluded that the use of a distant health centre and hospital is a reflection of other non-distance related considerations such as perceptions of quality of health care (Noor et al., 2003). This conclusion is also evident in a study on the use of government health facilities in Pakistan where it was found that cost and availability of alternative private health facility were primary determinants of whether to seek care from the closest government facility (NoorAli et al., 1999).

Most of the studies cited on distance effect on accessing health services have tended to use Euclidean distance (meaning distance is measured in a straight line in metric terms, such as miles or kilometres) (Muller et al., 1998, Rutherford et al., 2010). Some authors have argued that such measures have limitations especially in developing countries where geographical terrain, challenges with transportation and road conditions can significantly affect travel time (Rutherford et al., 2010). Considering that the opportunity cost of care seeking is regarded as crucial in the decision making dynamics of care seeking (Ensor and Cooper, 2004), travel time remains a substantial consideration as it has implications on total time spent in care seeking. In view of the limitations of Euclidean distance measures, distance that is measured in terms of travel time from household to a health facility, has been suggested (Noor et al., 2006, Rosero-Bixby, 2004, Rutherford et al., 2010).

Cognisant of the Euclidean distance measure limitation in health care seeking, Noor et al. (2006) conducted a study in four highly researched districts of Kenya to determine the effect

of distance on health care utilisation. In the study they used geographic mapping technologies and mapped household locations and government health facilities. Travel time was also estimated accounting for physical terrain and transportation specific to the study settings. Using utilisation data with this background information, they found that proximity to a health facility was not a major determinant of health utilisation, rather people preferred facilities of higher order in the referral chain (Noor et al., 2006). Similarly, Swan-Kremeier et al. (2005), conducted a study on the effect of distance travelled on attrition in an eating disorders treatment regime in the USA. Their findings indicated no statistically significant difference in drop out and treatment completion between patients in proximity to and those further from a treatment facility.

3.8.2 Cost of accessing health care as determinant of health care seeking behaviour

Cost of health care to the patient/client and household has been a subject of interest for a long time in health literature. Moreover, recently there has been laudable attention on the goal of reaching universal health coverage (Moreno-Serra and Smith, 2012, Sachs, 2012, Savedoff et al., 2012) which inherently pursues removal of financial barriers to accessing health services and protection from catastrophic health expenditure. Literature has predominantly stated cost of health care in terms of user fees (Akashi et al., 2004, Ansah et al., 2009, Burnham et al., 2004, Powell-Jackson et al., 2012) even though the importance of other costs such as transportation, opportunity cost has been acknowledged (Ensor and Cooper, 2004, Laokri et al., 2013). Following this trend, the subsequent sections will highlight evidence on how cost of accessing health care determines care seeking. Various studies have demonstrated that cost to health care is a critical determinant of care seeking.

A randomised controlled trial conducted in rural district of Ghana evaluated the effect of payment at a health facility on childhood health outcomes as a primary outcome and health care utilisation as one of the secondary outcomes. The intervention group consisted of households which were provided with a prepayment mechanism hence did not pay for health services at the point of use while the control group used the standard health service that required out of pocket payment. The trial found a small but significant difference in health care utilisation in that the intervention group utilisation of health services increased compared to the control (Ansah et al., 2009). Correspondingly, the use of non-formal health

services was found to be significantly less among children in the intervention arm compared to their counterparts in the control arm (Ansah et al., 2009).

Furthermore, Hill et al. (2003) conducted a study in rural Ghana using mix methods approach and found that cost was a crucial determinant of care seeking. In their study, 50% of care givers did not seek care for their sick children from a formal health facility even when they had recognised danger signs of a childhood illness. Inability to pay for hospital bills, transport and medication was cited by 33% of households as reason for failure to seek health care. A study conducted in Gambia, reported in Rutherford et al. (2010) found that 20% of care givers with ill children did not seek health care services because of health service cost.

Using information from 154 narratives from care givers of sick children recruited from health facilities in Zambia, Baume et al. (2000) concluded that cost is a barrier to health service use as care givers for ill children expressed not attending a clinic that charged user fees. In rural Uganda, households financial constraints hindered access to adequate care for children (Hildenwall et al., 2007) and in Zambia, user fees selectively reduced hospital utilisation especially admissions for girls under the age of six years (Malama et al., 2002).

While there is limited empirical evidence of the effect of cost on health care use by the urban poor and slum residents, the available evidence cite cost of health care as a significant deterrent of child health use. In the urban slums of Kenya, Breiman et al. (2011) noted a low usage of health services and respondents cited cost of health care as a specific deterrent. Shetty (2011) provides an illustration of the plight of the urban poor and slum residents with regard to the effect of cost of health care, indicating that: "*they do not have the capacity to afford health care that wealthy city dwellers access but neither do they benefit from health programmes run by non-governmental organisations or governments in the way that rural areas do. In short they fall through the cracks, living in the hinterlands of health care*" (p 627).

A systematic review of research studies from mid-1990s to mid-2000s on how different health financing mechanisms affect health care utilisation in low and middle income countries by Palmer et al. (2004) found that user-fees deterred health utilisation. Conversely, evidence from studies before and after abolition of user fees in various settings such as Kenya (Mbugua et al., 1995), Zambia (Blas and Limbambala, 2001, Masiye et al., 2010), South Africa (Wilkinson et al., 2001), Uganda (Burnham et al., 2004, Nabyonga et al., 2005, Xu et al., 2006), and

Cambodia (Jacobs and Price, 2004) and user fee exemption in some settings, such as Thailand (Coronini-Cronberg et al., 2007) resulted in an increase in health care utilisation.

However, the complexities of designing an effective user fee exemption system that is inclusive of all intended beneficiaries has been an elusive subject and evidence suggests health systems have not been entirely successful with exemption programmes (Ridde et al., 2012).

In essence, Mbugua et al. (1995) argues that user fee exemption for children's health services may not achieve optimal effects considering that children are physically and economically dependent on their mothers. In a study conducted in Kenya, it was found that utilisation of health services under five years who had hitherto been exempted from user fees, also rose by 26% after registration fees for all primary care at hospitals were removed. The authors suggest that this may be explained by the fact that dependence on their mothers meant that children could be taken to facilities that their mothers used (Mbugua et al., 1995). User fee exemption for the children was therefore described as 'a necessary but not sufficient condition for ensuring them access to health care' (Mbugua et al., 1995).

In addition, a systematic review by Lagarde and Palmer (2008) gauged the existing evidence on the effect of user fees on health care utilisation and only included experimental and quasi experimental design studies. Even though the authors called for continued high quality studies in this area, they conclude that from the available studies there is some evidence that user fees deter health care utilisation. In this systematic review, the effect on health service utilisation, resulting from four key scenarios of: removal of user fees; introduction of user fees; decrease in user fees; and increase in user fees, was evaluated. The evidence suggests that in various settings the removal of user fees resulted in an increase in health care utilisation in curative services but also had a long run effect of increasing utilisation in preventive services even when they might have been free, hitherto. Conversely introduction of user fees significantly reduced health care utilisation in various settings. In particular, the review cites a study in Kenyan schools where the introduction of user fees for deworming treatment led to a decline in utilisation from 75% to 19% (Miguel and Kremer, 2007).

Decreasing user fees was found to lead to higher service uptake, as exemplified by the case in Sudan where a 25% and 75% reduction in user fees led to a more than proportionate

increase in the number of pregnant women and children seen in health centres (Abdu et al., 2004). Furthermore, studies that evaluated the effect of increasing user fees found that an increase of user fees in the public health sector led to a decrease in health care utilisation but a user fees increase in the private health sector did not lead to a change in demand (Lagarde and Palmer, 2008).

However, a key concern on the removal of user fees has been the resultant compromised quality of health care characterised by limited availability of drugs, longer waiting times, and reduced staff morale (Gilson and McIntyre, 2005). This, it has been argued, may lead to phenomena where health utilisation increases immediately after removal of user fees and may decrease again due to quality concerns by potential users. Some authors have thus argued that where user fees have increased as a result of quality improvements, utilisation levels may remain unchanged or may initially decrease and then rise again (Litvack and Bodart, 1993, Akashi et al., 2004).

In Cambodia, introduction of user fees at a particular hospital led to increases in utilisation of various services, such as a doubling of outpatient attendances, as a result of improvements in quality. The study further reports that patient satisfaction had increased to 94% after introduction of user fees (Akashi et al., 2004). Another study in Cambodia reported similar results where utilisation of services declined in the first two months after introduction and increasing user fees but recovered after quality improvements without further changes on the fee structure (Jacobs and Price, 2004). It is however noteworthy that this was in the context of user fee exemption for the poor.

In spite of numerous studies that have found that user fees or general cost of health care are a deterrent to access to health care, two robust systematic reviews have noted various methodological limitations of existing evidence, and further suggesting need for more high quality studies (Palmer et al., 2004, Lagarde and Palmer, 2008). In these reviews, most studies evaluating the effect of user fees on health care utilisation could not wholly meet the quality assessment criteria of the Effective Practice and Organisation of Care (EPOC) group of the Cochrane Collaboration (Lagarde and Palmer, 2008). To illustrate this argument, in their systematic review, Lagarde and Palmer, (2008) found about 243 studies of potential relevance and after subjecting them to standard inclusion criteria remained with only 16 studies.

Furthermore, the authors posit that *"only one study was found to be of good quality and even studies that have been highly influential and often quoted failed the quality appraisal"* (Lagarde and Palmer, 2008; p 844).

However, the complexity of the health system context to allow studies with strict designs of randomised controlled trials to determine effect of user fees or general health cost on health status and utilisation has been acknowledged (Lagarde and Palmer, 2008). Indeed the various changes in the macroeconomic and health system environments bring about various effects at household and broader environments to the extent that attribution is problematic (Powell-Jackson et al., 2012). This also presents a particular limitation of before and after studies, which are a common design to evaluate such health system effects (Lagarde and Palmer, 2008).

Literature presents substantial evidence on the impact of user fees on health care utilisation. However, some authors have argued that a predominant focus on the impact of user fees has led to little focus on the significance of indirect health care costs such as transportation, food, accommodation and other supplies, in affecting access to health care (Rutherford et al., 2010, Thaddeus and Maine, 1994). Furthermore, others have argued that care seeking decisions are also determined by the opportunity cost of seeking the type of care in question (Asenso-Okyere and Dzator, 1997, Ensor and Cooper, 2004, Mustafa and Babiker, 2007).

A cost of malaria treatment study in Ghana found that indirect cost of treatment accounted for 64.2% of the total cost of treating a malaria episode (Asenso-Okyere and Dzator, 1997). A similar study in Sudan, however, found indirect cost per case of malaria treatment to be about 34% of the total full treatment of a malaria case (indirect cost: $3.2 and direct cost: $6.2) (Mustafa and Babiker, 2007). In a randomised experiment on effect of user fee removal on selected child health indicators in a district in Ghana, non-user fee cost of health care accounted for 22% of total out-of-pocket health spending (Powell-Jackson et al., 2012) and the authors acknowledged its significance.

Moreover, despite the long standing interest in health system discourse and debates around user fees, some key questions either remain unanswered or inadequately tackled. According to Lagarde and Palmer (2008) these key questions include: which patients, in the event of user fee introduction, price increase, price decrease or removal, increase or decrease their

utilisation of health services, and for what health conditions; what are the longer term impacts of fee introduction or removal; what are the effects of fee changes on the quality of care, drug use and health worker motivation as well as utilisation.

Some recent studies have provided some evidence to these key issues. A study assessing the effects of removing user fees for primary health care in Zambia and for children over five years old in Niger noted that in both contexts removal of user fees led to increases in health care service utilisation but with erosion of this positive effect over time in Zambia (Lagarde et al., 2012). The 32% increase in health service utilisation noted in the immediate aftermath of abolition of user fees in Zambia, declined from month to month and by 18 months post user-fee abolition, it fell to 19%. Niger on the other hand, had sustained increases over time. The study also reports various effects of user fees on non-targeted population groups. For example, in Zambia, use of health services by under five children who were exempted from user fees even prior to the policy change, fell by 23%, 18 months after policy change. The authors assert that this was due to the crowding out effect of the policy change, meaning that the resultant increase in utilisation of health services by other population groups led to health system challenges that compromised effective service delivery ultimately reducing utilisation among population groups that had hitherto benefited from user-fee exemption. Furthermore, differential implementation of the user fee abolition policy by districts and the general increase in health service use consequently led to other challenges such as limited drug supply, longer waiting times and a compromise in quality of care (Lagarde et al., 2012). This underscores other observations in literature that determinants of health service demand are complex and cost is not the only one (Akashi et al., 2004, Andersen, 1995, Jacobs and Price, 2004, Lagarde et al., 2012, Litvack and Bodart, 1993, Powell-Jackson et al., 2012).

3.8.3 Social networks as determinants of health and health care seeking behaviour

Although there has been relatively less discussion in literature pertaining to social capital as a determinant of health care seeking compared to other conventional determinants such as distance and cost, its importance in influencing care seeking behaviour and general child health has been acknowledged (Colvin et al., 2013, Fantahun et al., 2007, Rutherford et al., 2010, Waterston et al., 2004). Nonetheless, such discourse begs the initial question of what social capital entails.

The multi-dimensional nature of social capital has been noted (Fantahun et al., 2007, Mitchell and Bossert, 2007). Definition of the concept therefore presents a starting point to appreciate the existing evidence in so far as its influence on health care seeking and health status is concerned. Social capital has been variously defined but with notable interlinked themes emerging from these definitions.

According to Coleman (1988) in Mitchell and Bossert (2007) social capital is defined as "*a resource embedded in social relations that permits individuals and/or communities to achieve desired goals*" (p 2). Putnam, (1995) in Sujarwoto and Tampubolon (2013) defines social as "*features of social organisation such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit*" (p 1). The Organisation of Economic Cooperation and Development (OECD) defines social capital as "*networks, together with shared norms, values and understandings which facilitate cooperation within or among groups*" (OECD, 2000). Furthermore, social capital is defined as "*the capacity of individuals to command scarce resources by virtue of their membership in networks or broader social structures*" (Portes, 1998; p 12). Notably, the individual and community level foci emerge from the definitions. In this study, social capital is conceived as a resource of the caregiver made available through her interaction with and conception of the community she lives in and that this may influence child health seeking practices.

A two dimensional view of social capital namely 'structural' and 'cognitive' features in studies of social capital (Mitchell and Bossert, 2007). As Mitchell and Bossert (2007) postulate the structural dimension relates to "*behavioural manifestations of network connections, such as participation in voluntary organizations*" while the cognitive dimension "*reflects attitudes such as trust in others and norms of reciprocity*" (p 51). In line with this understanding, key questions that have elicited social capital scores in various studies have included: the ability to borrow money in case of need, membership in a voluntary community organisation, leadership and degree of involvement in a voluntary organisation, nature of collaboration within social groups, ability to trust people (Fantahun et al., 2007, Mitchell and Bossert, 2007, Waterston et al., 2004).

A broader focus encompassing six dimensions of social capital was provided by the World Bank in their integrated questionnaire of social capital measurement (SC-IQ-Six dimensions), including: groups and networks; trust and solidarity; collective action and cooperation; information and communication; social cohesion and inclusion; and empowerment and political action (Grootaert et al., 2003). The authors of the questionnaire have however noted that the groups and networks dimension is the often recognised and largely synonymous with social capital in many cases (Grootaert et al., 2003). Cognisant of this, review of literature on this aspect will be more inclusive, incorporating studies that cite social capital as comprehensively demonstrated by Grootaert et al. (2003) or the groups and network reference which seems a narrower view. Nonetheless, the context specific application of social capital embracing these dimensions has been acknowledged (Fantahun et al., 2007, Grootaert et al., 2003) and especially with regard to understanding the association or causal pathways in so far as its influence in individual health behaviours and health status is concerned.

Even though the specific pathways linking social capital to health are not fully understood, various association mechanisms have been proposed (Mitchell and Bossert, 2007). High social capital provides for opportunities for preventing illness and receipt of help (such as borrowing money to pay for costs associated with health care) in times of hardships such as childhood illness (Fantahun et al., 2007). Low social capital on the other hand has been associated with social deprivation, social exclusion and poverty to the extent that opportunities for support in times of need are either limited or non-existent (Fantahun et al., 2007, Waterston et al., 2004). This consequently affects general household health and that of vulnerable members such as children (Cassell et al., 2006, Fantahun et al., 2007, Waterston et al., 2004).

Social groups / organisations are a medium of communicating ideas, setting norms and may elicit behaviours that positively influence and lead to better health among members (Mitchell and Bossert, 2007). Conversely, the social association of groups may result in influences and adoption of group behaviours that negatively impact health, such as group resistance against vaccination or dispensation of bad messages (Adams et al., 2002) or may lead to subsequent alienation of some members whose access to services may be affected (Cassell et al., 2006). Evidence exists of the influence of social capital on population health in general and child health in particular (Fantahun et al., 2007).

While it has been postulated that low social capital is associated with poverty and social deprivation hence its influence on health may in part be as a result of the influences of these socioeconomic factors, studies have affirmed the independent association between social capital and positive health status (Fantahun et al., 2007, Sujarwoto and Tampubolon, 2013, Waterston et al., 2004). A prospective case-referent study of under-five deaths conducted in Ethiopia noted that social capital is a crucial factor for child survival as a higher proportion of vaccinated children and lower levels of child mortality were noted among women with higher social capital scores compared to their counterparts with lower social capital scores (Fantahun et al., 2007). Crucially, the influence of social capital on the two child health indicators was noted to be stronger than socioeconomic status and literacy of women (Fantahun et al., 2007), affirming the assertion that in many community based settings, social networks may have stronger influence than traditional measures of access to health care such as distance and cost (Rutherford et al., 2010).

Similarly a mixed methods study on childhood vaccinations in rural and urban Gambia found that attendance to child clinics and completion of vaccination were related to strong social networks (Cassell et al., 2006). A component of this study, using ethnographic techniques, found that clinic attendance, especially in the rural areas, was taken as a social event that was supported and promoted through women peer group networks and village music groups. This phenomenon was less prominent in the urban context where the urban poor women and recent urban migrants felt marginalised and excluded and consequently reportedly got discouraged and limited their clinic attendance (Cassell et al., 2006). This illustration from Cassell et al. (2006) sums up experiences of the urban poor and new migrants and their children in the study context; "*observation and narrative suggested that some mothers felt excluded and worried by the clinic crowds; especially mothers who were poorer, recent immigrants, who lacked fine clothes or had thin babies who might provoke others' moral disapproval*" (p 387).

Indeed social exclusion has been cited as one of the critical barriers of access to health care (Rutherford et al., 2010) and the Social Exclusion Knowledge Network of the WHO's Commission on Social Determinants of Health asserts that it is a crucial determinant of health inequities for which little attention has been paid to in most developing countries (SEKN, 2008).

Another case-control study in Gambia found that the odds of dying were higher for under-five children whose primary care givers lacked help with meal preparation, had no one to relax with, had no one who could offer good advice (Rutherford et al., 2009) all of which are social capital factors (Mitchell and Bossert, 2007). These social factors retained significance after controlling for confounding factors while traditional measures of access (distance and cost of health care) lost their significance. Similarly, a cross sectional study in Mali found that the odds of under five deaths were reduced among care givers of the Fulbe ethnic group who reported practical, cognitive and emotional support (Adams et al., 2002). Consequently, Rutherford et al. (2009) argue for a rethink of strategies promoting access to health care as social capital factors, and not distance or cost, may be more important.

In some cases, there has been mixed evidence on the influence of social capital on access to child health care and other child health indicators. For example, the same study that found the protective effect of social capital for under-five child mortality among women of the Fulbe ethnic group in Mali also found that emotional support was a surprising risk factor for child death among the Bamanan ethnic group (Adams et al., 2002). In the same vein, another study in Gambia also noted that 'not having someone who showed caring and kindness to the caregiver' provided protective effect against child death (Rutherford et al., 2009). The authors have highlighted the need for cultural specific indicators of social capital (Rutherford et al., 2009, Rutherford et al., 2010).

Qualitative studies have also provided substantial evidence suggesting that social capital is a crucial determinant of access to health care. In essence, early evidence of the need to further examine social factors as determinants of access to child health care and health status indicators emerged from qualitative and ethnographic inquiry. A study in Chad found that social networks were important facilitators or barriers to accessing health care among pastoralist women (Hampshire, 2002). The following illustration presents the phenomenon in this regard "*It is clear that what happens to a woman (and by extension probably her child) during period of ill health is dependent to a substantial degree on the networks available to her and on her ability to mobilise them effectively*" (p 1033). In Guinea, social support along with time availability, social status were cited as important considerations when accessing health care (Gordon, 2005 cited in Rutherford et al., 2010).

A systematic review of qualitative research of household recognition and response to child diarrhoea, pneumonia and malaria in sub-Sahara Africa noted that recognition and response to these childhood illnesses is a deeply social affair (Colvin et al., 2013). This illustration from Colvin et al. (2013) demonstrates the relevance of social capital pertaining to symptom recognition and health care seeking for childhood illnesses:

"*Treatment decision making is an inherently social process, especially in settings where lack of resources increases the vulnerability and interdependence of all members of households and communities. Social relationships serve a multitude of vital functions, from mobilising resources and sharing information to interpreting the meaning of misfortune and managing the distribution of blame*" (p 74).

There is paucity of evidence of the influence of social capital on child health seeking practices among the urban poor or slum residents. Most studies conducted on child health in urban slums and among the urban poor (Breiman et al., 2011, Coronini-Cronberg et al., 2007, Montgomery and Hewett, 2005, Ndugwa and Zulu, 2008, Taffa and Chepngeno, 2005, Taffa et al., 2005) have tended to focus on other socioeconomic factors with the impact of any component of social capital hardly explored.

Nonetheless, a study measuring social capital in the slums of Manila in Phillipines noted that people with extensive social networks within and outside the slum had better access to resources such as water and electricity. And those with stronger internal networks had access to resources within the slum and at cheaper prices (Matous, 2007). This is suggestive of the influence of social capital even in access to some social determinants of health in a slum setting. This notwithstanding, some authors have postulated that there is general erosion of social capital in slum settings and the strength of social ties is lower relative to rural areas (Cassell et al., 2006). To an extent, this contextual attribute of urban living may influence access to child health care services and other child health indicators in ways or directions different from the conventional understanding.

3.8.4 Care givers autonomy as a determinant of care seeking and child health status

In spite of the paucity of studies evaluating the effect of care givers autonomy in developing countries, there is some evidence suggesting the protective effect of care givers autonomy against under-five child deaths and as a facilitative factor to accessing child health care (Ensor

and Cooper, 2004, Fantahun et al., 2007, Rutherford et al., 2009, Thaddeus and Maine, 1994). Almost all studies focussing on children and their primary care givers have demonstrated that it is women, particularly mothers of the children that are primary care givers. With this viewpoint and depending on conceptual references by various studies, some parts of this section will refer to female or women's autonomy as a proxy for care givers autonomy.

Autonomy of care giver plays a particularly significant role in societies characterised by male dominance. In these contexts, major household decisions including health care seeking decisions may be considered masculine responsibilities. This is typical in many sub-Saharan African countries where women are primary care givers of children but decisions pertaining to child health such as seeking health care are made by men or undertaken by their authority (Adams et al., 2002).

It has been recognised that definitions of autonomy have sometimes been blurred (Kravdal, 2003) and therefore conceptual clarity is warranted in the setting and when it is used. Kravdal (2003) loosely defines women's autonomy as "*their rights and freedom to act as they choose relative to those of men*". In addition, five dimensions of autonomy have been proposed namely: 'economic autonomy' (access to economic resources); 'physical autonomy' (freedom of movement); 'decision-making autonomy' (opportunity to take part and be heard in discussions with members of the family or significant others); 'emotional autonomy' (closeness between husband and wife); and 'knowledge autonomy' (freedom to obtain and use general knowledge) (Kravdal, 2003).

These dimensions of autonomy are closely linked and so dependent on each other that their conceptual boundaries are equally blurred (Kravdal, 2003). In illustration, a woman needs decision making powers to effectively decide or contribute to decisions about the health of a child, but also needs freedom of movement (physical autonomy) and the economic resources to effect the decision, such as taking the sick child to a health facility. Moreover, throughout the decision making dynamics, a woman needs to possess the knowledge to inform her decisions and negotiations; and have a relationship with her husband (or significant others as the cultures may determine) to effectively navigate through the social decision making process.

With regard to dimensions of autonomy above, most studies on autonomy of care givers have referred to autonomy of decision making and the ability to control economic resources (Chibwana et al., 2009, Fantahun et al., 2007, Mtango et al., 1992, Rutherford et al., 2009). However, on the basis of the close linkage and interaction of these dimensions (Kravdal, 2003), it is likely that all the autonomy facets were practically at play in reported care givers autonomy.

A large case-control study conducted in the Bagamoyo district of Tanzania using verbal autopsy to determine risk factors for under-five child deaths found that lower levels of mortality were strongly associated with a mother being a sole decision maker for treatment. In the same study, mothers who were sole decision makers for child treatment were two and half times more likely to utilise health services than their counterparts who lacked autonomy in decision making (Mtango et al., 1992). Another study of similar design in Ethiopia also found that mortality of children among women with low decision making score was three times more than their counterparts with higher scores and the significance was retained in a multivariate analysis (Fantahun et al., 2007).

Using the National Family Health Survey data, Kravdal (2003) demonstrated that lower levels of child mortality were noted among women with a higher decision making score. Specifically, significant effects on child mortality were noted for physical, emotional and decision making autonomy dimensions while no effect was observed for economic autonomy (Kravdal, 2003). In a similar study conducted among Indian women, autonomy was found to be significantly associated with use of contraceptives (Moursund and Kravdal, 2003). In this regard, it is probable that such association pathways are also true for access to child health services.

Based on their study in Gambia, Rutherford et al. (2009) concluded that financial autonomy has great potential to increase the primary carers ability to access and pay for health care when a child is in need. In relation to effect of financial autonomy on under-five mortality, the study found higher risk of under-five child mortality for care givers who had little say on how earned money was spent compared to their counterparts who had greater say.

The challenges of defining autonomy within the research context have similarly been unearthed. In this regard, some authors have suggested that women may sometimes formally ascribe decision making to their husbands while practically they were involved in the decision

making (Fantahun et al., 2007). While this presents the difficulty of measurements of autonomy or participation in decision making, others have also argued that if different aspects of household decision making have been elicited, it is unlikely that such informal decision making dynamics may affect the association between autonomy and child mortality or other child health indicators (Fantahun et al., 2007). Nonetheless, the need for further investigation especially with regard to extent of women involvement in decision making and their respective effects, has been acknowledged (Fantahun et al., 2007).

Concerns with regard to measurement of autonomy and attribution of its effects to child health indicators are obviously important especially for quantitative studies. However, the wealth of qualitative evidence on this matter further suggests that autonomy is a critical determinant of access to health care for children. A qualitative study conducted to denote the sociocultural predictors of health care seeking for febrile under-five children in two rural districts in Malawi noted that some women waited for approval from male members of the family or other elders to seek health care (Chibwana et al., 2009). This is corroborated by findings from South Africa where a qualitative study found that limited autonomy of care givers was a significant barrier to access health care for sick neonates (Sharkey et al., 2011) and in Ghana (Tolhurst et al., 2008) where decision making to access health care for children depended on male members of the household. In the Volta region of Ghana, some qualitative narratives suggested men's responsibility for financial resources and hence decisions related to child support including seeking health care for children (Tolhurst et al., 2008). These findings explicitly unearth the negative effect of low economic, decision making, and physical autonomy pertaining to use of child health services.

A systematic review of qualitative studies by Colvin et al. (2013) affirms that the need for women to obtain permission from their husbands to seek health care and pay for associated costs, was one of the consistent findings of the studies reviewed. In the same vein, Williams and Jones (2004) critical review of studies on behavioural issues of malaria control and management in sub-Saharan Africa affirmed that aspects of low autonomy of women are critical factors contributing to delay in accessing health care for children. Based on their findings Williams and Jones, (2004) noted:

"In spite of women often being the first to recognize illness and having the responsibility for illness management, they may be prevented from seeking appropriate treatment as ultimate decision-making responsibility and control of finances may lie outside of their social purview" (p 510).

Precisely, Williams and Jones (2004) cite that several studies have demonstrated that treatment decisions for children are often the prerogative of males or senior household members. These circumstances represent the social dynamics of women's decision making, economic and physical dimensions of autonomy (Kravdal, 2003) which are varied depending on the geographical and sociocultural context (Tolhurst et al., 2008).

3.8.5 Health system factors as determinants of care seeking for child health services

It is acknowledged that decision to access health care for children (even adults) entails a complex interaction of individual care giver, household, health system and other external factors (Andersen, 1995, Chuma et al., 2009, Chuma et al., 2010, Penchansky and Thomas, 1981, Molyneux et al., 2002). The health system factors constitute supply side factors in discourse pertaining to access to health care services and include: distance, cost of health care (mostly user fees), quality of care, and availability of medicines (Chuma et al., 2009) . Evidence on the first two as determinants of care seeking for child health services and general child health and survival has been presented in preceding sections (3.8.1 and 3.8.2). The subsequent sections will review evidence from literature on other health system factors such as quality of care which inherently constitutes multiple factors.

According to a review of literature on access to prompt and effective malaria treatment in Kenya by Chuma et al. (2009), health system factors are crucial determinants of care seeking for children and adults. The review noted that insufficiency of medicines and other supplies especially in the public sector limited access to these health facilities and prompted people to buy medicines Over The Counter (OTC). Indeed, another review focusing on what attracts patients to health facilities noted that availability of medicines was an important factor in many study findings (Kizito et al., 2012). A study conducted to determine access barriers to malaria treatment in Kenya noted that 30% of respondents in a cross sectional household survey and about 39% of respondents in clinic exit interviews reported that they did not get prescribed medicines from the hospitals pharmacy as they were out of stock (Chuma et al.,

2009). In Malawi, participants in a qualitative study in Mwanza and Neno districts reported persistent unavailability of essential medicines as a demotivating factor to seeking health care for their under-five children (Chibwana et al., 2009). Similar findings have been reported in various other studies in Kenya (Opwora et al., 2011), Zambia (Baume et al., 2000) and Sierra-Leone (Diaz et al., 2013).

Other factors, inherent in the quality of health care perspective of care givers which influence their health seeking practices for the ill children include; attitude of health workers; waiting time at the facility and opening times of a health facility (Baume et al., 2000, Chibwana et al., 2009, Chuma et al., 2009, Kizito et al., 2012). For example, Chuma et al. (2009) report that participants in focus group discussions on the quality of health care received from a health facility cited that health workers are inconsiderate and have a negative attitude towards clients which eventually discourages them from seeking care especially from public facilities. Others, (Baume et al., 2000, Chibwana et al., 2009, Opwora et al., 2011) also reported poor attitudes of health workers as a barrier to access of health services for under-five children in studies conducted in Malawi, Zambia and Kenya respectively. Evidently, Hanson et al. (2005) also argue that within multiple dimensions of perceived quality, patients have reportedly been more responsive to non-technical dimensions such as interpersonal relations quality, amenities and opening hours.

Qualitative studies have provided substantial evidence suggesting that waiting time at a health facility and opening times are critical barriers to access to health services. The longer queues at health facilities leading to long waiting times coupled with delayed opening of facilities (Cassell et al., 2006, Chibwana et al., 2009, Chuma et al., 2009, Colvin et al., 2013, Kizito et al., 2012, Opwora et al., 2011) entail a higher opportunity cost for care givers thereby influencing care seeking decisions (Ensor and Cooper, 2004). Indeed, findings from a study in Zambia by Baume et al. (2000) corroborate this as an extract from one of the narratives affirms "*I hate standing on long queues for hours. You arrive as soon as they open the clinic, but you can still be there even after lunch. I thought of trying treatments at home since I had an idea what was wrong with her*" (p 1497).

Similarly, how a child is examined has been cited as an important quality dimension which though remotely reported in literature, is a salient consideration in care seeking decisions for

care givers (Baume et al., 2000, Hanson et al., 2005). Thorough examination is an important quality of health care attribute and some studies have reported care givers' satisfaction (or dissatisfaction) with health care services based on the nature of examination (Baume et al., 2000, Hanson et al., 2005). Evidently, a Discrete Choice Experiment (DCE) study conducted in Zambia found that thoroughness of examination was the most important quality of health care attribute influencing demand for acute pneumonia health care services for children and cerebral malaria for adults (Mangham et al., 2009).

Despite their acclaimed rigor in eliciting people's preferences for health and other services, very few DCE studies have been conducted in low income countries, particularly in sub-Saharan Africa to denote drivers of care givers demand for health care services for their children (Mangham et al., 2009). However, the few ones conducted on health care services, albeit focusing on adults, have unearthed various health system factors that are important to people in considering uptake of health care services (Kruk et al., 2010, Kruk et al., 2009, Mangham et al., 2009)

For example, DCE studies to elicit important attributes of a health facility for obstetric care (particularly delivery) in Ethiopia revealed that availability of drugs and equipment, seeing a highly qualified health worker and a receptive provider attitude were the most important health system factors (Kruk et al., 2010). In Tanzania, respectful provider attitude, availability of drugs and medical equipment were crucial demand factors in that order (Kruk et al., 2009). Another population based DCE study conducted in Zambia found that thoroughness of examination was the most important health system attribute followed by staff attitude and drug availability represented the most important health facility characteristics eliciting demand for health care services (Hanson et al., 2005).

Upon deciding to seek health care outside the home for the sick child, the next decision for a care giver entails the choice among multiple health service providers. According to Kizito et al. (2012) the health system determinants of care seeking such as those presented hitherto, are important and considered in spite of which health provider and level of health service provision. While the decision making dynamics including the associated power interplay and negotiations at household level may not be explicitly discussed in literature (Colvin et al.,

2013), the choice of health provider may be dependent on the differential appeal of health providers with regard to the health system factors.

In this respect, literature presents varying context specific findings on which health providers are preferred by care givers. For example in India, care givers predominantly sought care from private formal health providers, followed by informal health care providers and the public health providers were the least utilised (Sreeramareddy et al., 2012). On the other hand, in Burkina Faso, health care for a childhood illness episode was mostly sought from the public sector (Wilson et al., 2012). Further to this, factors that determine whether to seek care outside home, crucially influence which health provider to use. In particular, evidence exists suggesting use of private providers by higher income groups in some settings (Goldman et al., 2002). In various other settings, local shops and traditional healers or herbalists constitute a significant group of health providers especially for initial contact by care givers (Breiman et al., 2011, Goldman et al., 2002, Sreeramareddy et al., 2012).

This, notwithstanding, Colvin et al. (2013) presents a typology of stepwise treatment seeking for children with malaria, pneumonia and diarrhoea that begins with care givers' recognition of symptoms and home response as the first step, followed by seeking advice and negotiating access as the second step, after which the use of middle layer providers such as drug sellers, community health workers is practised followed by the fourth step of accessing formal biomedical services. However, the process is not linear as iterative and back and forth decisions and practices are undertaken and not every care giver reaches the purported final step.

3.8.6 Socioeconomic factors as determinants of care seeking for child health services.

Extensive evidence has existed over the years on the relationship between socioeconomic factors and population health and its determinants including health care seeking behaviour. Socioeconomic status has traditionally been quantified using two factors namely levels of education and household income (Barros et al., 2010). Nonetheless, in many cases socioeconomic status has been used to mean household income and related measures such as wealth (as predominantly measured by asset indices in developing countries) and in some cases expenditure data (Barros et al., 2010). With regard to care seeking for child health services, evidence has accumulated over the years, largely demonstrating the positive

association of both education and income with health seeking behaviour for children (Boyle et al., 2006, Mosley and Chen, 1984, Parashar, 2005).

3.8.6.1 Maternal education as a determinant of care seeking for under-five child health care services

Maternal education has been shown to have a linear and reductive impact on child mortality and is facilitative in uptake of child health promoting behaviours such as health care seeking (Basu and Stephenson, 2005, Boyle et al., 2006, Mosley and Chen, 1984, Parashar, 2005). Empirical evidence exists elucidating that while overall, parental education has positive effect on child health indicators, maternal education has a greater effect in improvements in welfare than equivalent levels of male education (Basu and Stephenson, 2005). Not surprisingly the common cliché has emerged that *'training a woman is training a nation'* years after the Egyptian poet Hafez first said *"When you educate a woman, you create a nation"* at the dawn of the 20th century (Powell, 2012).

Various quantifications of the effect of maternal education on child health and survival have been made. Cleland and Van Ginneken (1988) report an estimation by the United Nations from fifteen countries which noted a 7-9% reduction in childhood mortality rate with every one year's increment in maternal education. Relatively recent estimates indicate that the risk of under-five survival falls by 2-5% for every additional year of maternal schooling (Basu and Stephenson, 2005). According to Basu and Stephenson (2005) the maternal education effect on child survival is usually stronger than income and paternal education and they more prominently, argue that: *"the improvements in child survival are seen at the very beginning of female education, whatever the initial conditions - socioeconomic, cultural, public services – and however unsatisfactory the nature of the schooling experience"* (p 2012).

Some authors have suggested that the influence of maternal education is more prominent in the post infancy child age category as opposed to infancy (from 1-11 months). This conclusion has been based on studies that have either found weak or no association between maternal education and infant mortality (Adetunji, 1995). For example, Adetunji (1995), while also suggesting potential errors in data, reports that findings from Demographic and Health Surveys for Ghana, Morocco, Trinidad and Tobago, Sudan, Namibia, Botswana, Nigeria and Tanzania did not find the inverse relationship between maternal education and infant

mortality. Nonetheless, relatively recent evidence from China in an analysis of infant mortality data from 1970-2001 indicates that increasing levels of maternal education are significantly associated with reduction in infant mortality (Song and Burgard, 2011).

It is noteworthy that divergent research findings and opinions on the association and causal link between maternal education and improvement in child health indicators have generated debates over the years. Some authors have argued that the association between maternal education and child health and survival indicators is *"nothing more than a reflection of better living conditions among the educated"* (Boyle et al., 2006; p 2243) and not necessarily an independent effect (Desai and Alva, 1998, Hobcraft, 1993).

As Desai and Alva (1998) argue, educated mothers tend to come from wealthy households with good environments associated with good health infrastructure, hygiene, and schools. Consequently, they conclude that the causality between the two variables may be spurious as they are probably due to inadequate socioeconomic controls in the analyses. Some support to this argument is rendered by findings from a study using DHS data from 17 countries by Bicego and Boerma (1993). In this study, 40% of excess risk for post-neonatal mortality among mothers with no education and 30% among mothers with primary education was confounded by economic conditions (Bicego and Boerma, 1993).

On the other hand, others have argued that education has an independent predictor positive effect on child health and survival indicators (Basu and Stephenson, 2005, Boyle et al., 2006, Parashar, 2005). More recently, a large study used nationally representative data sets from 175 countries to assess the effect of increased educational attainment on child mortality between 1970 and 2009 (Gakidou et al., 2010). Their findings indicate the substantial effect of maternal education attainment on under-five mortality. Evidently, the authors estimate that 51.2% (4.2 million) averted deaths of under-five children between 1970 and 2009 can be attributed to an increased educational attainment over the same period. By contrast, economic growth reportedly contributed to a reduction of only 7.2% of averted child deaths. The authors also estimated that if education attainment had remained at the 1970 levels, child mortality in sub-Sahara Africa should have increased due to the HIV epidemic (Gakidou et al., 2010).

One of the consistent causal pathways in the maternal education-child mortality reduction association is the use of child health services (Cleland and van Ginniken, 1988, Basu and Stephenson, 2005, Boyle et al., 2006). Moreover, Parashar (2005) demonstrated that beyond positive effects of a mother's education on her child, there may be an externality effect on the community. In the study, even after controlling for district level attributes such as health amenities index, wealth index, castes, religion, it was found that higher completion of immunisation was better off in districts with higher literacy rates (Parashar, 2005). The author suggests that this may be because *"even mothers with no education may be getting their children immunised due to contextual factors such as knowledgeable social networks, effective use of healthcare systems and institutionalised parental norms and expectations"* (p 996) of a community with high literacy levels.

In spite of the two contrasting positions, the causal pathways of the maternal education effect have been put forward within this discourse. Interestingly these pathways seem to logically embrace both schools of thought in the case that education influences a woman's autonomy over decision making and economic resources but also provides knowledge to navigate through the health and other social systems. In reference to utilisation of child health services Cadwell (1979) posits in (Adetunji, 1995), maternal education enables a mother to:

"be less fatalistic about childhood illnesses, can exploit health facilities of the city even when is a resident of rural villages, is potentially more capable of receiving attention from health workers and more informed about where the right facilities are and how best to exploit them to her child's advantage. She is more persistent in the recommended treatment, more likely to report back if the situation does not improve and more likely to give rest to a sick child" (p 256).

Furthermore, maternal education potentially changes the locus of decision making in the household and allows the mother to have more effective negotiation with her husband and hence can command more resources for child survival (Adetunji, 1995). It also endows the woman with knowledge and literacy for positive parental care giving which consequently affects child health and survival (Boyle et al., 2006).

Indeed various studies have been conducted in various settings and with different findings in that while some confirm the positive effect of maternal education, others have demonstrated

no effect in some child health indicators. A study conducted among the urban poor and urban immigrants in Bangladesh reported the protective effect of increasing education on under-five child mortality (Najnin et al., 2011). In Nigeria both maternal and paternal education were associated with care seeking from a health facility but of all other factors, only maternal education was associated with timely care seeking, defined in the study as within 24 hours of symptoms onset (Ogunlesi and Olanrewaju, 2010). In Nepal, Sreeramareddy et al. (2006) also noted that maternal education is a predictor of care seeking for childhood illness as higher levels of care seeking were associated with higher levels of mothers' education. Similar results, indicative of positive association between care seeking for childhood illnesses and maternal education have been reported in various settings such as Fosu (1994) using data from DHS in six sub-Saharan African countries; Hong et al. (2003) in Vietnam; and Becker et al. (1993) in the Philippines.

In contrast, some studies have not found a significant association between maternal education and child health service use. For example, a study by Pillai et al. (2003) in the Indian state of Kerala did not find maternal education to be a significant factor affecting treatment decisions for sick children. Similarly, a study in four poor districts of Sierra Leone did not find maternal education to be a significant factor for care seeking for malaria, diarrhoea and pneumonia among children (Diaz et al., 2013). Maternal education was also not a significant predictor of care seeking for childhood illnesses in Nairobi slums (Taffa and Chepngeno, 2005).

Some suggestions have been put forward to explain the absence of association between maternal education and appropriate care seeking. According to Pillai et al. (2003), care givers with better education may not seek care (or may not seek it promptly) because of two main reasons. Firstly their knowledge and recognition of symptoms accentuate their resort to home treatment especially in mild cases. Secondly more educated mothers, just like higher income ones, have access to resources needed to obtain care later if the illness does not resolve hence playing a wait and see approach

An argument that transcends the intermediary effect of other variables in the education-child health indicators association is the need to be aware of the context. Bicego and Boerma (1993) provided insights into this assertion in their study where absence or presence of

association including variations in the strength of maternal education effect were explained by some contextual factors. For example, maternal education had a very significant effect in rural areas of some countries due to poor access to health services than in urban areas with a relatively better access. Their rationale was that in such contexts, the educated mother, being endowed with the knowledge of symptom recognition and value for child health and services would still seek services (Bicego and Boerma, 1993).

3.8.6.2 Household income or wealth as determinant of child health care seeking behaviour

The link between poverty and health is well established in literature (Barros et al., 2010, Friel and Marmot, 2011, Subramanian et al., 2002, WHO, 1999). Likewise, the association between household wealth or income with child health indicators such as child mortality, stunting and use of health services continues to be subject of interest in literature (Adetunji, 1995, Boyle et al., 2006, Parashar, 2005, Penchansky and Thomas, 1981, Rutebemberwa et al., 2009). In particular, the need for an equity oriented pursuit of MDGs and tackling social determinants of health has provided greater prominence to the socioeconomic status and child health discourse within global health (Zere et al., 2012, Friel and Marmot, 2011). It is now common consent that economic development of a country affects health outcomes (Green, 2007, Barros et al., 2010, Subramanian et al., 2002). Moreover, Boyle et al. (2006) contends that household wealth *"offers leverage for improving child health in much the same way that economic development level can improve child health nationally"* (p 2243).

The causal pathways of this relationship entail that as household income increases, there is an opportunity for availability of economic resources that can be used to access health enhancing goods and services (Boyle et al., 2006). Indeed, with increasing income, households have opportunity for better access to determinants of child health such as nutrition, safe water, appropriate sanitation, recreation, health services (Barros et al., 2010, Subramanian et al., 2002). Their access to economic resources provide them with means to surmount barriers to health service access such as cost of health care, transport, and health workers may be more receptive in provision of care.

Empirical evidence exists from various settings in this regard. In a study on determinants of health care seeking for childhood illnesses in Nairobi slums using monthly expenditure as proxy for economic status, (Taffa and Chepngeno, 2005) found that care givers from lowest

expenditure households were 20-30% less likely to take their sick children to health facilities. Nonetheless, the study did not find a significant difference in care seeking between high and medium spenders within the three tier household expenditure variables of low, medium and high. An additional finding of interest in the study was that household income was significantly associated with care seeking up to a certain threshold (in this case 7431 Kenyan Shillings) (Taffa and Chepngeno, 2005). This affirms the tendency of diminishing returns relating to health benefits from socioeconomic status as noted by Subramanian et al. (2002) with respect to life expectancy and increasing income and by Boyle et al. (2006) with respect to under-five child mortality and malnutrition.

In an analysis of DHS data from 42 developing countries also found that household wealth had a reductive impact on child malnutrition up to a certain level before the association became weaker at higher levels of wealth. This was the case with a country like Malawi, whereas in Egypt, the association was stronger at higher levels of household wealth. The importance of context was therefore emphasised (Boyle et al., 2006, Parashar, 2005).

A study among the urban poor in Lucknow, India, to determine neonatal morbidity, out-of-pocket spending and care seeking noted that whereas there was no significant difference in neonatal morbidity, care givers from lower socioeconomic strata sought care lesser than their counterparts in higher strata (Srivastava et al., 2009). However, when the authors condensed the household income to two levels of lower strata (combining lowest to third highest) and higher strata (condensing fourth highest and highest), neonatal morbidity was higher for the lower group yet care seeking for any medical care was lower for the same lower economic strata group. (Srivastava et al., 2009). Another study on determinants of delay in care seeking for febrile children in eastern Uganda, care givers from households in the lowest socioeconomic quintile were more likely to seek health care late (Rutebemberwa et al., 2009). A study in Nigeria by Tinuade et al. (2010) reported that low socio-economic status was associated with poor home management of fever.

Using different estimation methods for household income (such as household spending, household wealth through asset indices, reported monthly incomes) various other studies have similarly reported significant positive associations between household income and child health indicators including health service use. Some examples, in addition to the ones cited

above include: Armstrong-Schellenberg et al. (2008) in southern Tanzania; Najnin et al. (2011) in urban Dhaka, Bangladesh; Sreeramareddy et al. (2006) in western Nepal, Sreeramareddy et al. (2012) in India; Becker et al. (1993) in Metro Cebu, the Philippines; Zere et al. (2007b) in treatment of diarrhoea and ARI for under five children in Malawi; Barros et al. (2010) in an analysis of socioeconomic inequities for all the health regions of the world; Fotso (2006) in fifteen countries in sub-Saharan Africa.

There is strong evidence supporting the association between household wealth and child health use and other impact indicators such as infant and child mortality. This notwithstanding, some studies have reported contrasting findings. Indeed, Amarasiri de Silva et al. (2001) in a study conducted in Sri-Lanka found that care seeking for childhood illnesses were similar across all socioeconomic groups. Using DHS data for Ghana Zere et al. (2012) found that while inequities in stunting, underweight, diarrhoea, anaemia were significantly prevalent among the lower wealth quintile households, treatment of diarrhoea, full immunisation status and sleeping under ITNs did not exhibit any wealth gradient.

Similarly, Diaz et al. (2013), in a cross-sectional study in Sierra Leone did not find any association between socioeconomic status and health care use for children. Instead an association in the opposite direction was noted where children of lower quintiles utilised health care more than those from higher wealth quintiles. Likewise, Pillai et al. (2003) did not find an association between health care seeking for childhood illness and household's socioeconomic status.

3.9 Summary of the Chapter

This chapter has reviewed literature pertaining to two thematic areas namely: urbanisation and urban living as determinants of child health; and access to child health care services and factors that influence health care seeking practices in the event of childhood morbidity. The chapter has demonstrated the following salient features in literature pertaining to urban health, that:

- urbanisation is on the increase especially in the developing countries and as a consequence there is demographic pressure in urban areas of developing countries;
- Malawi is among the fastest urbanising countries in the world, and in the context of urban poverty, there is a corresponding increase in proportion of people residing in

urban slums. These urban slum residents experience a greater burden of morbidity, especially among children;

- the urban environment influences child health in multiple ways among them: the urban physical environment, changing population composition, and urban governance;
- the urban child health advantage may be diminishing as evidenced by narrowing gaps in various child health indicators in some contexts partly due to stagnation or worsening of child health indicators in urban areas resulting from urban poverty mostly manifested through slum residence.

In literature discourse pertaining to overall under-five child health, childhood morbidity and its corresponding access to child health services, the following salient features have been noted, that:

- despite improvements in child health indicators globally, the burden of childhood morbidity remains high especially in sub-Sahara Africa including Malawi;
- access to health care is a critical determinant of child health and survival;
- while there has been significant improvements in increasing coverage of child health services many children still lack adequate access to health care interventions. This happens in the context of availability of proven cost-effective interventions;
- distance to health facility, cost of health care services, care giver's social capital, care giver's autonomy, other health system factors (availability of medicines, attitude of health workers and nature of examination); maternal education, and household income constitute key determinants of care seeking for child health services.

Additionally, debates around these areas have been explored. Of particular note is the fact that there are relatively few studies that have had a specific focus on the urban slums or the urban poor even though there has been an extensive body of knowledge relating to access to child health care.

CHAPTER 4

CONCEPTUAL FRAMEWORK FOR THE STUDY: ANDERSEN'S SOCIO-BEHAVIOURAL HEALTH UTILISATION MODEL

4.1 Introduction

This PhD thesis uses Andersen's socio-behavioural health care utilisation model as its conceptual basis. Since its initial development in the 1960s, the model has undergone various modifications, and it is the fourth phase of the model of 1995 that this study effectively relates to. This section therefore describes the following; selected theoretical frameworks of potential relevance to this PhD research and the subsequent choice of Andersen's framework; history of Andersen's socio-behavioural health care utilisation framework; components of the framework; application of the framework in this thesis; and summary of the chapter.

4.2 Competing frameworks and the choice of Andersen's socio-behavioural health care utilisation model

Various conceptual models exist and have been applied in understanding health seeking behaviours in various studies. In the conceptual stages of this PhD research, various potential theoretical frameworks were considered to denote their relative suitability in explaining the phenomena under study. Social cognition models including the: Health Belief Model, Theory of Reasoned Action and its successor Theory of Planned Behaviour; and Self Efficacy theory have been widely used to predict and explain health seeking behaviours (Lyons and Chamberlain, 2006).

However these models have faced criticisms with regard to their conceptual foundations. The salient criticisms include the following (Lyons and Chamberlain, 2006, Hausmann-Muela et al., 2003) that they:

- assume human beings are overtly rational, always seeking the best possible health benefit or outcome in the decisions they make. However, in reality, human behaviour can be irrational and multiple factors might be at play especially in complex behaviours. *"In general, they overestimate the capacity for an individual to choose*

and follow behaviour which is considered adequately" (Hausmann-Muela et al., 2003. P 18).

- attempt to isolate and estimate weight of key factors in influencing behaviour and yet key factors cannot really be separated from the context in which such behaviour is influenced by the factors isolated.
- give prominence to individual level characteristics yet the external environment such as health system factors, the broader macroeconomic and social environment are equally critical.

Other models that have been used to explain health behaviour in literature are those generally described as pathways models (Hausmann-Muela et al., 2003). These models are identified by their descriptive view point of the sequence taken to seek health care from a provider and typically express from symptom recognition to seeking health care (Colvin et al., 2013). Similarly the descriptive nature of these pathways may not be suited for investigation of a more complex environment where decisions may be influenced by multiple factors, including those outside the household such as health system factors. Moreover, health care seeking decision making for children may not be linear as these models predominantly imply in their description of sequence of events leading to care seeking.

The Four *A's* model (Availability, Accessibility, Affordability, Acceptability) has also been used to explain access to health care (Penchansky and Thomas, 1981) and has been popular among health geographers (Hausmann-Muela et al., 2003). This model, while potentially useful as well in view of its focus on both health system and care giver (including household) factors, falls short of recognising other social considerations within which households and care givers operate.

Bronfenbrenner's Ecological theory was also of potential relevance to this PhD thesis. This theory posits that the environmental context, comprising five systems critically influences child health, survival and development in varying ways (Santrock, 1999). These systems include: *microsystem* (immediate environment to the child directly affecting growth, survival and development); *mesosystem* (interaction of microsystems and their collective effect); *exosystem* (the environment that is seemingly outside the child but affects the micro and meso systems such as parents jobs); *macrosystem* (the overarching structural environment such as government policy or society culture); and *chronosystem* (patterning of the child's

environment over time implying the temporal static nature or changes to the child's environments) (Santrock, 1999). This model is holistic and was also considered potentially relevant for this PhD research. However, it was considered too broad hence more suited to explaining influences on the developmental process for the child of which access to health care is just one of them. In other words it presented a risk of generality thereby losing the efficiency of a specific focus that models specifically developed for explaining health care seeking have.

As largely alluded to hitherto, while acknowledging that this thesis has conceptual linkage with almost all these theoretical frameworks, implying potential relevance of each of the models mentioned above, the Andersen's socio-behavioural health care utilisation model is deemed the most appropriate. The rationale for this choice is provided in section 4.5

4.3 History of the framework and a brief content description of each stage of the model

The Andersen's socio-behavioural health utilisation model used in this thesis is the fourth generation model following modifications to the original. The initial model was developed in the 1960s and had a family as a unit of analysis. Its theoretical premise was that "*people's use of health services is a function of their predisposition to use services, factors which enable or impede use, and their need for health care*" (Andersen, 1995; P 2). Precisely, the model suggested that there are predisposing characteristics (e.g. health beliefs, social structure, demographics); enabling resources (e.g. personal/family community) and need (perceived and evaluated) that independently and interactively predict and explain health service use. This philosophy of the model has remained, and subsequent modifications have only provided clarity and/or added features within the realms of the three group factors (predisposing, enabling and need). According to Andersen (1995), some predisposing factors were regarded as exogenous, some enabling resources were regarded as necessary but not sufficient to elicit health service use, and definition of need was essential for health service use to take place.

The second phase of the model was as a result of modifications to the original model, by Aday, Andersen and their colleagues at the Centre for Health Administration Studies at the University of Chicago in about 1973 (Aday and Andersen, 1974). At this stage of modification, the importance of the health care system in determining health behaviour was recognised thereby inclusion of national health policy, resources and organisation of health care system.

User satisfaction was also added as an explicit outcome of health service use as an important determinant. Other additions included elaboration of health service use to include type, purpose, site, and time interval (Anderson 1995) effectively recognising multiplicity of health care providers and levels of health care.

The third phase evolved in the 1980s. While maintaining the originality of the initial model, health outcome levels as perceived by the population and health professionals were added to user satisfaction. The influence of other external factors on health service use such as political, economic and physical were recognised and added to the model. Andersen (1995) argues that the use of health services is essentially a means to achieving other ends and health outcomes.

Andersen (1995) further argued that the basis of health utilisation is to ensure that in addition to achieving user satisfaction, population health status should improve thereby ensuring what was termed 'effective access'. Moreover, both user satisfaction and improvement of health status should occur with relative increase in consumption of health care – which was termed 'efficient access'. Thus while the goal of the model remains to study health utilisation, it is important for policy to go beyond utilisation and consider health outcome factors, both as perceived by the population and as evaluated by health professionals (Andersen, 1995).

The fourth and currently final phase of the model emerged in the mid-1990s and proposes that there are multiple influences on health services use and by extension on health status outcomes. Additionally, there are feedback loops suggesting that health outcome, in turn influences predisposing and need factors as well as health behaviours (Andersen, 1995, Hausmann-Muela et al., 2003).

4.4 Components of the framework

The Andersen's socio-behavioural health utilisation model posits that health care seeking behaviour is a function of a set of three individual characteristics namely: predisposing, enabling and need (Amin et al., 2010, Andersen, 1995). Essentially, *"the actual seeking of health services is assumed to be a sequential and conditional function of the individual's predisposition to use health services, their perceived need to use them, and their ability to obtain the services"* (Amin et al., 2010; p 2). Specifically, attributes of the three core model

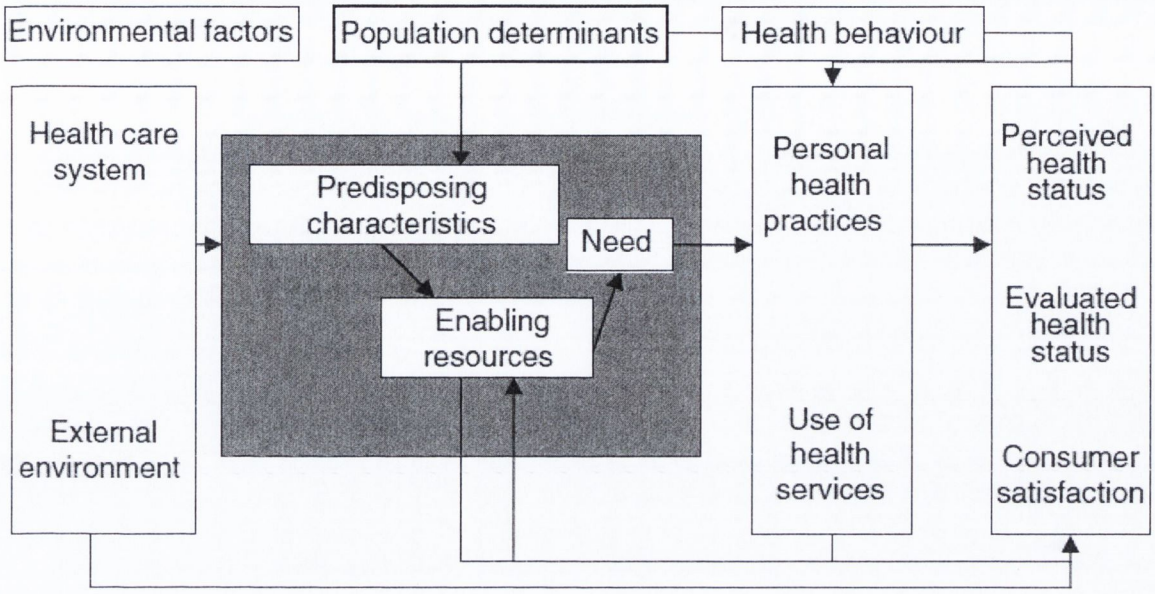
factors constitute as described below: (Amin et al., 2010, Andersen, 1995, Hausmann-Muela et al., 2003).

Predisposing factors constitute demographic, social structure and health belief characteristics. The demographic (age, gender, marital status) reflect the propensity of some individuals to use health services. Demographic factors such as age and gender are said to provide the biological imperative for use of health services at some point. The social structure characteristics (religion, education, ethnicity/tribe/race) entail the capacity of the individual to cope with the problem, investigates the resources available in the community, and the physical environment in which the individual/family lives. The health beliefs entail the general knowledge about health and the perception and value that the individual attaches to health and the health care system or its components such as health workers and biomedical interventions.

Enabling factors reflect the ability of the individual to utilise health services. These factors are at personal (such as income, health insurance coverage, experience with use of health service, waiting and travel times); and organisational (availability of health providers and their spatial distribution) levels. The model posits that both personal and organisational factors must be present for health service use to occur. Precisely, health services and personnel must be available to provide the opportunity for use and individuals must have the ability and knowledge to use the available health services.

Need factors reflect the definitive point of eliciting use of health services. Two components of need factors have been proposed, namely: perceived need and evaluated need. *Perceived need* factors are due to personal assessment (or in the case of children, care giver's) which include perception of severity, total number of sick days for a reported illness, total number of days in bed and combination of symptoms. *Evaluated need* refers to assessment findings by health professionals such as a physician using standard clinical procedures or severity ratings. Figure 4.1 below illustrates the components of the framework and the inherent interactions that ultimately lead to use of health services and health status.

Figure 4.1: Andersen's socio-behavioural health utilisation model



Source: Andersen (1995)

As figure 4.1 demonstrates, it is important to note that beyond the predisposition to health services, the factors that interact with the predisposition to enable use and the need factors that define potential use, there are various factors at play influencing the decision making dynamics. Indeed, Andersen (1995) notes that for access to be realised (use of health service) the environmental factors (on far left of the diagram) are crucial. Hence health care system factors such as spatial distribution, cost of provision play an important role influencing the interaction within the three factors described. Similarly the external environment is an important determinant influencing the interactions of many components of the model. Specifically the model cites economic, political and physical environments as crucial in this regard.

Most of these components and the interactions thereof have been described and highlighted in description of the evolution of the model from the original to the current fourth stage. A common thread of argument in the framework entails the multidimensional nature of decision making and the multiplicity of factors that collectively determine use of health services (Andersen, 1995).

Nonetheless, criticisms, much of which relate to the initial and early stages of the model are worth of note. These include that: there is little emphasis on the influence of social networks on an individual's decision; it overemphasises the importance of need factors as prime determinants of health service use at the expense of health beliefs and social structure; and that organisational enabling factors have not been given enough attention (Andersen, 1995, Hausmann-Muela et al., 2003). However, Andersen (1995) argues that more detailed organisational enabling factors can easily be included in the analysis without "*causing too much damage to either measures or the model*" (p 3). Social interactions on the other hand, it is argued, can appropriately be embedded in the enabling resources.

4.5 Rationale for choice of the Andersen socio-behavioural health utilisation model

Cognisant of the existence of multiple models for health service use and the criticisms of the Andersen model, the reasons for choice of the Andersen's model are fivefold.

Firstly, the current Andersen's socio-behavioural health care utilisation model captures multiple factors that influence health care seeking behaviour of care giver for under-five year old children. The inclusion of external environment and population characteristics transcend individual level influences and thus constitute an example of the holistic nature of the model. Precisely, it recognises the multidimensional and dynamic nature of health seeking behaviour, especially through incorporation of individual, health system and other macro level factors.

Secondly, the specific recognition and prominence of health system factors as crucial determinants of care seeking behaviour is of specific relevance considering that denoting relative significance of health system factors in influencing care seeking decisions is one of the prime objectives of this PhD research.

Thirdly, the model is widely accepted for assessment of health service use and is generally among the most cited in recent health service use literature, including for child health. Furthermore it has previously been used in studies investigating child health care seeking practices (Rutherford et al., 2010, Amin et al., 2010, Sreeramareddy et al., 2012).

Fourthly, the recognition that health outcomes including health service user satisfaction are actually crucial to subsequent care seeking behaviour is important in view of the goal for

responsiveness of a health system to people's expectations, which is being explored both quantitatively and qualitatively in this PhD thesis.

The fifth reason relates to the recognition of the interconnectedness of multiple and complex factors and the feedback loop therein which implies the potential for temporal changes in the environment (factors of influence) and hence suitable for the longitudinal design of this PhD research.

4.6 Application of the Andersen's socio-behavioural health utilisation framework to the thesis

In line with Andersen's model, the conceptual basis of the PhD research is that the health seeking behaviour of care givers in urban slums is determined by various predisposing, enabling and need factors; among which are those amenable to changes at household, community and policy levels in order to promote child health and survival. Essentially the framework has guided review of literature, choice of data collection instruments and modifications thereof; data analysis and discussion aspects of this PhD research.

Indeed the literature review section has demonstrated the evidence with regard to influences of various model components on health care seeking for children. For example, enabling factors such as household income, care giver's autonomy, care giver's social capital; and health system factors such as distance to health facility, cost of health care, and waiting time, have been explored in the literature review section.

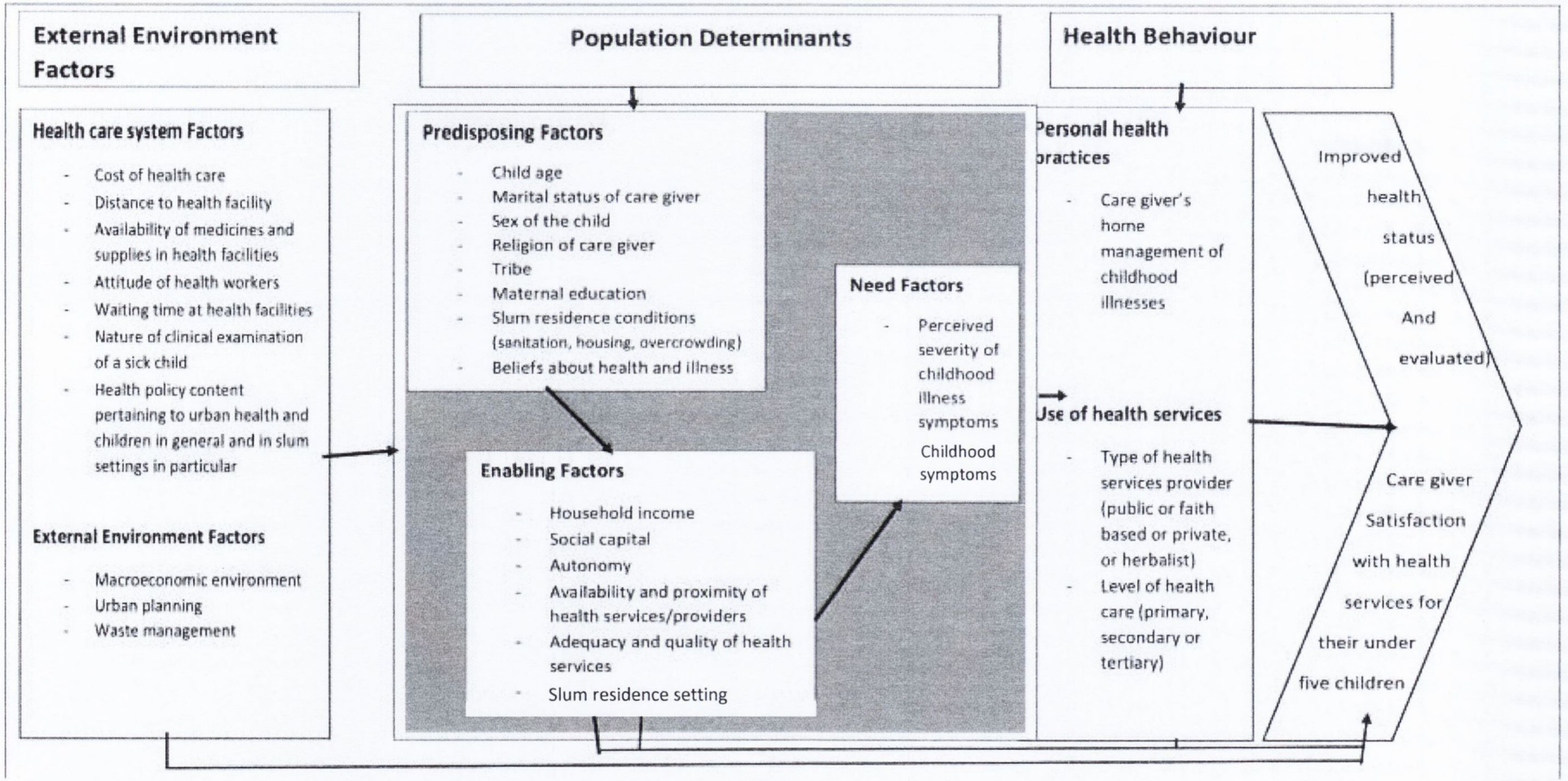
Admittedly, there has been little emphasis on evaluated need, for two main reasons. Firstly, evaluated need in the context of the study actually entails a point at which care has been sought. Secondly, inclusion of evaluated need entailed questions about clinical diagnoses and outcomes and their subsequent influences on next care seeking – a feat which was beyond the scope of this study considering that care givers and not health professionals were primary respondents in all the designs of this PhD.

The influence of the external environment is captured through including health system factors in influencing care seeking decision. This is largely done through the DCE and qualitative inquiry; and to some extent quantitative questions in the observational prospective design. The external environmental influence is implicit in its influences in the health system

considering the effect of macroeconomic environment on health system funding and consequent availability of drugs and supplies. The socioeconomic status of the household also entails the broader environmental influence. An inclusion of other attributes of the external environment for assessment was beyond the scope of the study but its influences are recognised just as the model posits.

The application of the Andersen's model to this PhD thesis is therefore diagrammatically presented in Figure 4.2 below with generic model factors replaced with appropriate features as per design and implementation of this PhD research.

Figure 4.2: Determinants of care seeking for under-five child health services in urban slums of Malawi: application of Andersen's health utilisation model



CHAPTER 5

CHILDHOOD MORBIDITY, CARE GIVERS RESPONSE AND DETERMINANTS OF CARE SEEKING OF UNDER-FIVE HEALTH SERVICES: AN OBSERVATIONAL LONGITUDINAL STUDY

5.1 Introduction

The longitudinal study design was intended to achieve the first four objectives of the PhD research namely, to: 1) determine care givers' response to under-five childhood morbidity; 2) identify factors that influence decisions to seek health care outside the home for common childhood illnesses; 3) determine treatment seeking actions focusing on significance of various health providers; 4) assess knowledge of child danger signs and determinants of knowledge of child danger signs. In this regard, this chapter presents the methods, findings, discussion, and strengths and limitations of the longitudinal cohort study design.

5.2 Methodology

As per the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) statement which provides standard guidelines in reporting observational studies, the methods section will include the following areas of the longitudinal cohort study: design; participants' eligibility criteria; sample size; sampling frame and recruitment procedures; data collection instruments and methods; statistical analysis; and validity and reliability considerations (von Elm et al., 2008).

5.2.1 Study design

This study used an observational longitudinal cohort design which entailed selecting a cohort of interest and prospectively following it up for a specified period of time to observe specific outcomes of interest (Bailey et al., 2005). Longitudinal studies are lauded due to their ability to observe temporal effect and provide opportunity for multiple observations of the outcomes of interest (Bailey et al., 2005). Moreover, longitudinal studies effectively provide opportunity to establish a causal link between an outcome and exposures or other explanatory variables of the outcome of interest (Lyons and Chamberlain, 2006).

The longitudinal design was therefore chosen for this study as it provided opportunity for temporal observation of childhood morbidities; health care seeking behaviour; timeliness in

care seeking; knowledge of child danger signs in the context of ongoing household and health system interactions over a specified period of time. Additionally, the longitudinal nature of the study provides for multiple observations in outcomes under investigation thereby improving probability of more reliable estimates than would have been the case with single point observations in cross-sectional designs.

This study design entailed selecting a cohort of care givers of under-five children meeting eligibility criteria as elucidated in section 5.2.2 and following them up for a period of 9 to 12 months to investigate: morbidity of their children; their responses to childhood morbidity and their knowledge of child danger signs. This follow up entailed collecting data over three time points namely: t0 (baseline), t1 (first follow up), and t2 (second follow up) with a time interval of three to four months from one data collection point to the next. Specific details of data collection in t0 to t2 are provided later under section 5.2.5.

5.2.2 Eligibility criteria for the study

Children under five years of age and their care givers in Senti, Mgona and Ntandire urban slums of Lilongwe constituted the population for the study.

In order to obtain participants for the study, an eligibility criteria was employed to the study population. To be included in the study, the following inclusion criteria needed to be met:

- Children under five years of age and their care givers. In particular, a maximum age of 53 months was indicated. This was due to the intention to still have a sample of children who were below the age of five years by the final follow up. Thus considering an anticipated 6 months after baseline, 53 months was the upper limit so that by the end of the follow up, a child who was 53 months of age was still going to be under five years of age (59 months).
- Resident in urban slums of Senti, Mgona or Ntandire.
- The pair of care giver and child should have had no plans to migrate within a year to afford a maximum availability during the 12 months prospective follow up period as per design.
- Give informed consent to participate in the study.

Conversely participants were excluded from the study if they did not meet the above criteria.

5.2.3 Sample size

The study used a sample of 543 pairs of under-five children and their care givers. The minimum sample size for the study was noted to be 384 as calculated from a sample size calculation formula of:

$$n = (z)^2 \times p(1-p)/e^2$$

Where *n* is the sample size, *z* is the value at 95% Confidence Interval (= 1.96), *p* is the probable response rate of appropriate care seeking (determined as 50% from literature), and *e* is the standard error (estimated at 10).

Longitudinal studies are prone to attrition of study participants (Bailey et al., 2005, Bowling, 2009) and urban slums are also known for potential mobility of people (Islam and Azad, 2008a). Cognisant of these two factors, an increase of about 41% to the calculated minimum sample size was factored in to maintain study power by the end of the follow up phase (t2).

A Probability Proportionate to Size (PPS) calculation was used to determine the minimum contribution of each slum to the overall sample size. As Bowling (2009) asserts, PPS is crucial in probability sampling that involves many units with different stages as it gives the same probability for selection for each person and that larger units cannot exert too much effect on the total sample. The following sample sizes: Ntandire, 245; Mgona, 188; and Senti, 110 were thus used.

5.2.4 Sampling frame and recruitment procedure

The participant recruitment process entailed conducting an initial census to determine the sampling frame as per eligibility criteria and undertake random sampling.

It should be noted that while data was available from the 2008 Malawi Population and Housing Census from which listing of households with under-five children could have been extricated, it was decided that a census was more suited in the area for two main reasons. First, the census, having been conducted in 2008, was outdated for the population of interest for the study considering that even children who were a year old at the time of the census would be five years at the time of final anticipated follow up (t2). Second, considering the context of high out-migration in the slum settings, it was highly probable that a significant

proportion of children who may still have been eligible at the time of recruitment, for this PhD research may have migrated out of the study areas.

A study specific census was conducted in August to September, 2011 to enumerate all eligible care givers and children in each of the study settings using a door-to-door method. Information captured during the census included: names of under-five children in the household; name of the primary care giver for the child or children; description of the house's location (house number where available and/or landmark description). At this stage, details of the study were explained to all potential study participants and permission was sought if their details could be collected and captured in a database for purposes of random sampling. There was a 100% acceptance rate at this stage hence all potential study participants approached were captured in the database.

A total of 2860 pairs of care givers and their children was enumerated in all three settings with respective figures as follows: Ntandire (1464) Mgona (922) and Senti (474). A database of care givers and their children was coded with numbers and stored in a Microsoft excel format. A random selection using computer generated numbers from Microsoft Excel was done to select participants for the study in each of the study settings as per PPS sample size calculation. It is these randomly selected care givers that were requested to participate in this longitudinal study.

5.2.5 Data collection instruments and methods

Six data collectors trained by the PhD researcher collected data through face to face interviews with study participants in their homes. A structured questionnaire (Appendix V) based on the locally validated Community Integrated Management of Childhood Illnesses (C-IMCI) Key Family Practices questionnaire was used to collect quantitative data for baseline. Permission was granted by the Coordinator of IMCI in the Ministry of Health to use this tool. The tool was piloted and constitutes information on: health seeking behaviour, knowledge of danger signs, morbidity for common childhood illnesses, and other background characteristics (e.g. demographic characteristics of care givers). Additional background information including: questions on social capital and autonomy were adopted from a study in Ethiopia (Fantahun et al., 2007) and asset ownership questions were adopted from the Demographic and Health Survey and added to the baseline questionnaire.

Data collection during t1 and t2 used a structured questionnaire which slightly differed from the baseline tool in that it does not contain background information such as demographic characteristics, social capital, care givers autonomy, socioeconomic, and housing characteristics (only constituted questions from section 9 of the questionnaire used at baseline. Refer to Appendix V). The rationale for this omission is that this data was already collected in the baseline and it was unlikely that any of these levels could have changed in less than a year of the remaining follow up time. In essence, the questionnaire used for t1 and t2 mainly constituted information on: childhood morbidity; responses to childhood morbidity; and knowledge of child danger signs.

Both baseline and follow up data collection instruments were translated in the local Chichewa language which was subsequently used for data collection. On average, it took approximately 60 minutes to administer the baseline questionnaire and approximately 30 to 40 minutes for the follow up questionnaire used at t1 and t2.

Data was collected over three time points with an interval of three to four months between them. The three to four months interval was based on literature (Rutebemberwa et al., 2010) and practical considerations of research costs. To ensure effective follow up, every study participant was allocated a unique identifier in form of a number code at baseline data collection. In subsequent data collection points (t1 and t2) the same participant codes were used. Study participants' codes were also used during data entry and analysis thereby allowing linkage of each participant's information over the follow up period and the entire study.

Baseline data collection started in January, 2012 in Senti and finished with Ntandire in early March 2012. Data was collected from 110; 188; and 245 participants from Senti, Mgona and Ntandire respectively. In Mgona and Ntandire, there was a 100% acceptance rate at baseline data collection. However in Senti, consent was granted by 110 of the 112 participants requested to participate in the prospective study, representing a 98% acceptance rate. Consent was not granted by the other two because they reportedly did not have decision making powers and their husbands whom they reported were the appropriate ones to seek consent from were unavailable over the study period. An overall 99.6% (543/545) acceptance rate was therefore achieved at baseline.

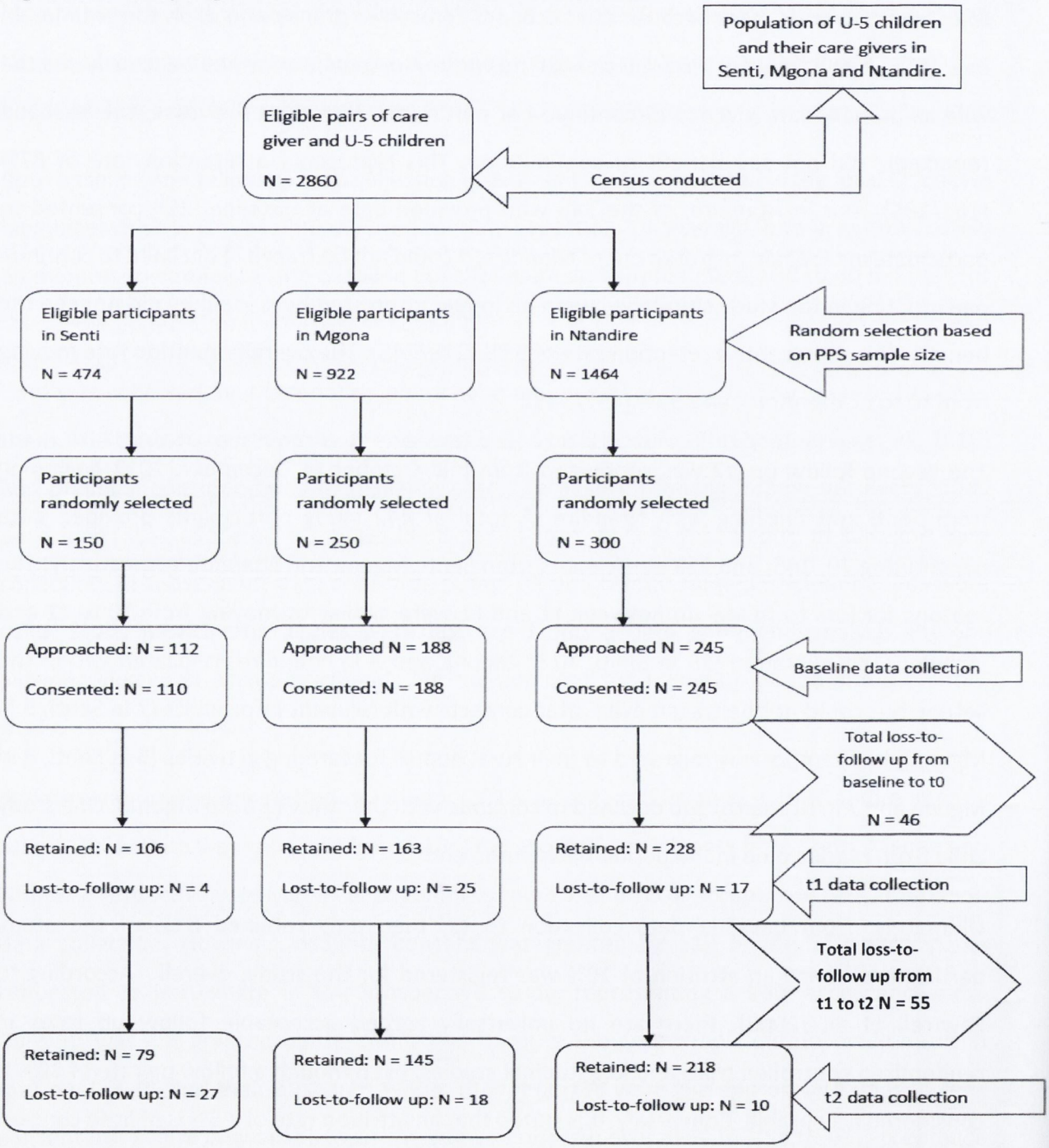
The first follow up (t1) data collection also started with Senti from late April, 2012 and finished with Ntandire in mid-June, 2012. Of the 110 who had provided data at baseline, 106 provided data in t1. One participant had withdrawn from the study for reasons that she declined to disclose, 2 had migrated out of Senti and 1 participant could not be traced. The retention rate at this stage for Senti was therefore 96% (106/110). In Mgona, 163 participants provided data at t1, 14 were reported to have migrated out of Mgona, 9 could not be traced and 2 declined to continue in both cases because the husbands refused to grant permission to continue. In one of the two cases, the husband claimed he was not originally informed hence advised the wife as primary care giver to discontinue her participation. In the other case, the husband reportedly did not see benefit of continuation. This represents a retention rate of 87% (163/188). And in Ntandire, of the 245 who provided data at baseline, 228 consented to participate in t1, 6 had migrated out of Ntandire, 7 could not be traced, 4 declined to continue participating in the study citing they were no longer interested because they did not see the benefit. This represents a retention rate of 93% (228/245). The overall retention rate moving from t0 to t1 therefore, was 92% (497/543).

The second follow up, t2 was conducted from mid-October to December, 2012 beginning from Senti and finishing with Ntandire. A total of 442 study participants provided data constituting 79; 145; and 218 participants from Senti, Mgona and Ntandire respectively. The reasons for loss to follow up between t1 and t2 were similar to moving from t0 to t1 and included: out-migration (15 in Senti, 10 in Mgona and 3 in Ntandire) relocated within the setting but could not be traced even after contacts with relevant informants (7 in Senti, 3 in Mgona); had temporarily migrated to their rural homes for farming activities (5 in Senti, 3 in Mgona and 7 in Ntandire) and declined to continue with the study (1 from Mgona). One study child from Mgona died in the period between t1 and t2.

Ultimately, from baseline data collection to t2, the study retained 81% of the study participants hence an attrition of 19% was registered for the study, overall. According to Fewtrell et al. (2008), there are no universally agreed acceptable follow up rates in randomised controlled trials and longitudinal studies, even though a follow up rate of 80% is considered acceptable. Conversely, it is stated that an attrition rate of $\leq 5\%$ is of little concern while an attrition rate of $\geq 20\%$ raises validity concerns.

The attrition in this study is therefore within acceptable limits. In addition, at the end of the follow up period, 442 participants were retained which is still higher than the calculated minimum sample size of 384. This entails the likelihood that the study retained its statistical power at the end of follow up. Figure 5.1 below presents a flow diagram illustrating the participant recruitment and data collection process.

Figure 5.1: Sampling frame, recruitment and data collection



Source: Author Note: t1 and t2 represent first and second follow up data collection points respectively

5.2.6 Data analysis for the study

5.2.6.1 Dependent and independent variables

This study used three dependent variables namely: care seeking from a biomedical health provider; timeliness in care seeking; and knowledge of child danger signs.

The specific definitions and construction of the dependent variables above are provided below.

- *Care seeking from a biomedical health provider*: This entailed seeking care from any of the biomedical health providers (described by type as public, faith based or private health providers).
- *Timeliness in care seeking*: To determine the timely health care seeking from a health facility, a dichotomous variable was created with a description of *'timely care seeking'* entailing seeking health care within two days and *'late care seeking'* describing seeking care more than two days after onset of childhood illness symptoms. This definition was based on African Union health summit resolution that every child with fever should seek care from a health provider within 24 hours (Rutebemberwa et al., 2010). Considering the measurement difficulties of '24 hours' in a setting with predominantly low education levels, 'within 24 hours' in this case descriptively referred to a period from onset of symptoms to next day. Thus after two days best described beyond 24 hours from onset of symptoms.
- *Knowledge of child danger signs*: Care givers were asked to mention childhood danger signs that warrant immediate care seeking from a health facility. The unprompted responses were measured against a list of seven general child danger signs on the questionnaire as stipulated by IMCI. These danger signs commonly result from the three conditions/symptoms of interest for the study (fever, ARI and diarrhoea) and they include that a child is: vomiting everything ingested, unable to drink or breastfeed, unconscious, extremely weak, convulsing, passing little and dark urine, and has sunken eyes. A dichotomous variable was computed where *'no/very little knowledge'* represented zero to knowledge of up to two child danger signs and *'knowledgeable'* entailed knowledge of more than two of the six danger signs in IMCI.

Independent variables included the following:

- Demographic factors (age of care giver and child, sex, marital status)
- Socio-cultural factors (tribe and slum residence)
- Care giver's social capital
- Care giver's autonomy
- Household wealth
- Perceived severity of childhood illness
- Care giver's education
- Parity of the mother
- Child birth order (first, second, third born etc.)
- Health system factors (distance, provision of education on danger signs during contact with health facility)

Some of the independent variables above warrant a brief definition and description of their construction. They include:

- *Care giver's social capital* was recoded from responses to five questions on the questionnaire which included: ability to borrow money in case of need, membership and/or leadership of social support groups, membership of community organisations, trusting people, thinking that people can hurt. A coding of 1 was given if present and 0 if absent for all questions except 'people can hurt' where a reverse coding was applied during data collection. A social capital variable was recoded with scores of 0 -2 and 3 - 5 computed for l*ow* and *high social capital* scores respectively.
- *Care giver's autonomy* was recoded based on responses from four questions pertaining to decision making powers such as: who makes 'big decisions' (decisions to change place of residence, buy, sell or reconstruct a house, rent land, etc.); routine household decisions that include decisions on buying and selling food items and day-to-day activities in the household; decisions to visit family and friends; and decisions to take a sick family member to a health facility. A code of 0 was attached to decision making that does not involve care giver and 1 where care giver is either involved or is the sole decision maker. An aggregate score of 0 – 2 was classified as *low autonomy* and 3 – 4 as *high autonomy* of care giver.

- *Household wealth* was constructed using Principal Component Analysis (PCA) in SPSS based on asset indices from asset questions in the baseline questionnaire. The information used emerged from questions on: housing structure (roof, floor, and wall materials); type of toilet; source of energy for cooking; ownership of radio, bicycle, refrigerator etc. Based on the Eigen values from the sample, household wealth categories were constructed and categorised into low, medium and high which corresponded to three equal categorisation of the maximum Eigen value. This approach was adopted from construction of household wealth indices in Demographic and Health Surveys which is widely accepted as a measure of household socioeconomic position (Bryce et al., 2013, Rutstein and Johnson, 2004).

In addition to the independent variables above, two categorical variables were created namely; *'data collection point'* and *'time-based care seeking'*. The categorical variable termed *'data collection point'* classified data by baseline (t0) and each of the two follow up data collection points (t1 and t2).

The *time-based care seeking* categorical variable denoted health care seeking across the period of the study and was used to determine if contact with a health facility/provider was associated with increasing knowledge of child danger signs. Thus this variable was categorised into four levels namely: not having sought care at all, having sought care once, twice and three times, over the study period. To illustrate, those care givers whose children had not reported any morbidity over the study period or may have reported some childhood morbidity but did not report seeking care from a health provider at any of the data collection points were classified as *'no care sought'*. Likewise those who reported having sought care at any one of the three data collection time points were categorised as *'sought once';* where care was reportedly sought in two of the three data collection points, a category of *'sought twice'* was attached and those who reported care seeking at each of the data collection time points were categorised as *'sought thrice'*.

5.2.6.2 Statistical analysis

Data was entered using a data entry software CS Pro version 5.0 by a team of trained data entry clerks. Data from each data collection point (t0, t1 and t2) was entered separately and later merged into a single data file and transferred into SPSS and Microsoft Excel formats.

Data cleaning was done by the researcher using both SPSS and Microsoft Excel. Data analysis involved two phases namely: baseline, and longitudinal data analysis.

Baseline data analysis

Descriptive analysis of baseline data

The first phase involved analysing baseline data using SPSS version 20. Descriptive statistics such as frequency counts and proportions of participants (care givers or under-five children) were used to summarise categorical data whereas the mean, standard deviation, median and range were used to summarise continuous data.

Pearson's x^2 tests were used to test the association between dependent and categorical independent variables, and were also used for comparison of independent variables within the three study settings.

Logistic regression analyses at baseline

Logistic regression models were developed using SPSS to determine predictors of the three dependent variables. Three main steps were applied in the process of developing logistic regression models for predictors of each of the three dependent variables.

The first step involved running a series of univariate binary logistic regression models in which the relationship of each of the independent variables with respective dependent variables was examined. Statistical outputs of this analysis for each dependent variable are presented using crude Odds Ratios (OR) with their corresponding 95% Confidence Intervals and indication of their statistical significance (or lack of it). Independent variables that were significant at 10% ($P < 0.10$) were considered important for inclusion in the next step of the process.

The second step involved undertaking collinearity diagnostics for independent variables chosen from the first step, considering that logistic regression is sensitive to multicollinearity (Pallant, 2010). Multicollinearity entails correlation between two or more independent variables in the model. This leads to redundant information about the dependent variable and decreases the reliability of estimates by increasing the standard error of the beta coefficients. Therefore to avoid these problems, collinearity diagnostics were undertaken using linear

regression, considering that such tests are not available in binary logistic regression in SPSS. The Tolerance and Variance Inflation Factor (VIF) were used. Tolerance provides indication of how much of the variability of respective independent variable is not explained by other independent variables in the model. The VIF is an inverse of Tolerance and is given by 1/T (1 divided by Tolerance). A Tolerance value below 0.1 and a VIF value greater than 10 are indicative of multicollinearity (Pallant, 2010). Output from collinearity diagnostics for each of the independent variables included for each of the dependent variable models indicated that there was no multicollinearity.

The third step involved running binary logistic regression models using variables from the first step having been assessed for multicollinearity in step two. Models used the "ENTER" method. However, education of the care giver and age of the child variables were treated as potential confounders hence were included in binary logistic regression models for care seeking and timely care seeking whether they had attained the $P < 0.10$ or not in the first step. Likewise for regression models on knowledge of child danger signs, education and age of care giver were included as potential confounders, based on literature. This stage represented the multivariate model and results were reported as Adjusted Odds Ratio (AOR) with their corresponding 95% Confidence Interval and indication of statistical significance. Statistical significance for the final models was set at $P < 0.05$.

Goodness of fit statistics were used to assess model fit with the data. The Hosmer-Lemeshow goodness of fit test was used to measure model fit. A good model fit is indicated by a Hosmer-Lemeshow test statistic value of $P > 0.05$. The Nagelkerke R Square was used as an indication of the variation in the dependent variable that could be explained by the model (Pallant, 2010).

Statistical analysis of longitudinal data

The second phase of data analysis for this longitudinal study design involved analysing longitudinal data which included all three data collection time points. In order to understand some key information at t1 and t2, descriptive statistics including; frequencies and proportions were conducted in SPSS and are reported for some key variables at t1 and t2.

A Cochran Q test statistic was used in SPSS to determine whether there was a statistically significant difference, over the time of the study, in proportions of childhood morbidity variables of: any childhood morbidity of interest; fever, diarrhoea, and ARI. Cochran Q test statistic is a non-parametric test used to determine if there is a statistically significant difference between more than two proportions in repeated measurements (Pallant, 2010).

Generalised linear mixed regression models for dependent variables

Longitudinal data from all three data collection points was arranged in a stacked format. R version 3.0.1 statistical software was used for longitudinal analysis. The lmer4 package in R was used to run generalised linear mixed regression models for each of the three dependent variables.

Two approaches were used in developing a final generalised linear mixed regression model for each of the three dependent variables. The first approach involved: (i) running a series of univariate exploratory linear mixed regression models to assess if respective independent variables predicted each of the dependent variables; (ii) factors that were significant at $P < 0.10$ were then included in the final model for each of the dependent variables. This represented the final mode of this approach.

The second approach involved using a discretionary backward elimination of variables based on *P* values. This approach entailed that in each dependent variable's model, all independent variables were included in the first model and a step by step elimination of variables based on high *P* values was undertaken hence reducing variables in the process. However, education of the care giver and age of the child were treated as potential confounders, hence were retained whether statistically significant or not. Similarly the data collection point (i.e. t0 to t2) variable was also retained at every stage because of the interest to denote temporal effect considering the longitudinal design of the study. A final model in this approach was determined by the Bayesian Information Criteria (BIC). The BIC is an evaluation criterion for models and depicts how different models fit the data. A model with the lower BIC is considered a better fitting model for the data (Konishi and Kitagawa, 2008). In this regard, the model with a lower BIC from the R software statistical output was chosen as the final model for this approach.

A random effect component was introduced using respondent identification codes (ID) (specified as: 1|ID) in each model for both approaches, thereby assuming a random mean for responses from each study participant and allowing these means to vary over the population. The random effect included in each of the generalised linear mixed regression models accounted for the repeated measures nature of the data, by introducing correlation over responses from the same individual.

Final models from the two approaches above were then compared to determine the final model of the longitudinal analysis. The choice of a final model was determined by the level of the BIC, hence the model with the lower BIC was chosen as it represented a better fitting model. Generalised linear mixed regression statistical output for the chosen model was reported using Adjusted Odds Ratios (AOR) and their corresponding 95% Confidence Intervals and indication of statistical significance. Statistical significance for longitudinal data analysis was also set at $P<0.05$.

5.2.7 Validity and reliability of the study

Validity and reliability are crucial components of research which implicitly encompass the quality of data collection instruments, data collection methods, study sample and other aspects of the research process. Validity is defined as the degree to which the study measures what it is supposed to measure (Bowling, 2009). Reliability of the instrument entails the extent to which the instrument can produce similar results in repeated investigations. To ensure validity of the study findings, reliability and clarity of the data collection instruments, various steps were undertaken in the study, including: expert review; training of data collectors; pilot study; and supervision during data collection.

5.2.7.1 Expert review of data collection instruments and training of data collectors

Prior to administering the data collection instrument in pilot, an expert review was sought to determine: if the questions were clear; if the content captured in the data collection instrument was relevant to the study; and if the data collection instruments were designed to capture relevant information to the extent possible. This was also meant to achieve the study objectives (internal consistency). A team of five experts comprising three research supervisors, one statistician and one child health expert were therefore independently

consulted. According to Bowling (2009) expert review of data collection instruments is crucial to ensure quality in the research process.

Moreover, to ensure data quality, three day's training for data collectors was also undertaken by the PhD researcher, prior to undertaking pilot study. The training included the following areas: basic research steps; interviewing techniques (including probing and prompting); community entry and ethics of research especially pertaining to obtaining informed consent, data collection and data protection; briefing on the research study protocol; going through the content of data collection instruments and administration of the questionnaire. Practical training sessions through peer interviews using the data collection instruments were also conducted as part of training.

5.2.7.2 Pilot study and supervision during data collection

A pilot study is defined as a smaller version of a proposed study conducted to refine the methodology, or broadly to develop and refine various steps in the research process (Burns and Grove, 2009). In this study, a pilot study was conducted for purposes of: determining internal validity of the data collection instrument; identifying difficulties to respondents in understanding data collection instruments either in form of ambiguous or difficult questions or flow of questions; determining how long it took to administer the data collection instrument; familiarising the researcher and data collectors with the study setting, data collection instrument in practical context and respondents; and to provide opportunity for training of data collectors.

A pilot study was undertaken in October and November 2011 in a part of Ntandire that was subsequently not included in the main longitudinal study. Data was collected from 34 care givers who met the study eligibility criteria. Based on the experiences and findings of the pilot study, modifications were made to the data collection instrument in form of rephrasing questions and deleting some questions. In particular, it was noted that questions on *care giver's autonomy* and *social capital* were difficult to comprehend. Consequently, these sections had to be rephrased and clearer ways of asking these questions during the interview were explored and led to modification of the questionnaire.

Furthermore, the PhD researcher conducted supervisions during pilot and main data collection to ensure adherence to the study protocol and ethical requirements. Random

quality checks of completed questionnaires were also undertaken on daily basis at the end of the field day. The quality checks included ensuring that: all questions were responded to (or at least that participants were asked), identifying if there were inconsistent responses, and if appropriate codes were printed on the questionnaire. After random checks, where appropriate, data collectors went back to study participants to seek clarification or solicit further information.

5.3 Findings of the longitudinal study

This section presents findings from the observational longitudinal cohort study design. The first part of the section will present results from the baseline data collection (t0), specifically including: background characteristics of the study participants; childhood morbidity at baseline; descriptive and logistic regression (binary and multivariate) analyses of the three dependent variables and their independent variables. The second part will present overall findings of the longitudinal study where a temporal description of dependent variables will be presented along with the relationship of the dependent and independent variables across the period of follow up as per results from baseline (t0) to second follow up (t2).

5.3.1 Background characteristics of study participants

A total of 543 care givers were interviewed for the study during t0. The majority of respondents were female (98%), mothers to the index child (study child) (94%) and married (90%). The predominance of females as primary care givers is consistent with socio-cultural norms within the study context and with other studies on care seeking for childhood illnesses elsewhere (Amin, et al., 2010, Bojalil, et al., 2007, Chuma et al., 2007). The mean age of care givers was 28 years (SD ± 7; range 16 – 73, median 27). The majority of care givers had senior primary school education (47%) followed by those who had attained secondary school and higher education (30%). The mean parity among mothers of the children was 3 (SD ± 2; range 1 – 10). While the Chewa tribe was predominant (32%), the tribal distribution generally reflects the heterogeneity of an urban setting.

The mean age of children included in the study was 26 months (SD ± 14; range 1 – 53, median 26). On average, the index child was third with regard to birth order in families (SD ± 2; Mode = 1). In general, distribution of background characteristics of study participants exhibited a similar pattern across all the three slums, as demonstrated by Pearson's chi-square *P* values

for each characteristic. Only education of the care giver shows an association with type of slum residence. Table 5.1 below illustrates study participants' background characteristics disaggregated by study area.

Table 5.1: Background characteristics of study participants at baseline

Background characteristics	Senti	Mgona	Ntandire	Total	P Value
	N= 110 (%)	N= 188 (%)	N= 245 (%)	N= 543 (%)	
Sex					
Male	3 (2.7%)	4 (2.1%)	2 (0.8%)	9 (1.7%)	0.35
Female	107 (97.3%)	184 (97.9%)	243 (99.2%)	534 (98.3%)	
Age of care givers (years)					
16 – 25	48 (43.6%)	81 (43.1%)	103 (42%)	232 (42.7%)	0.73
26 – 30	27 (24.5%)	54 (28.7%)	77 (31.4%)	158 (29.1%)	
≥ 31	35 (31.8%)	53 (28.2%)	65 (26.5%)	153 (28.2%)	
Education level of care givers					
No education / Junior Primary	23 (20.9%)	56(29.8%)	47 (19.2%)	126 (23.2%)	0.01
Senior Primary	47 (42.7%)	90 (47.9%)	118 (48.2%)	255 (47%)	
Secondary and above	40 (36.4%)	42 (22.3%)	80 (32.7%)	162 (29.8%)	
Age of children (months)					
1 – 11	18(16.4%)	41 (21.8%)	55 (22.4%)	114 (21%)	0.15
12 - 23	32 (29.1%)	42 (22.3%)	51 (20.8%)	125 (23%)	
24 – 36	40 (36.4%)	55 (29.3%)	67 (27.3%)	162 (29.8%)	
37 – 53	20 (18.2%)	50 (25.8%)	72 (29.4%)	142 (25.9%)	
Autonomy of care givers					
Low autonomy	45 (40.9%)	67(35.6%)	98 (40%)	210 (38.7%)	0.56
High autonomy	65 (59.1%)	121 (64.4%)	147 (60%)	333 (61.3%)	
Social Capital					
Low	48 (43.6%)	78 (41.5%)	94 (38.4%)	219 (40.5%)	0.61
High	62 (56.4%)	110 (58.5%)	151 (61.6%)	323(59.5%)	
Marital Status					
Single/Divorced/Widow	15 (3.6%)	17 (9.1%)	21 (8.6%)	53 (9.8%)	0.23
Married	95 (86.4%)	171 (90.9%)	224 (91.4%)	490 (90.2%)	
Maternal Tribe					
Chewa	44 (40%)	53 (28.2%)	76 (31%)	173 (31.9%)	0.21
Ngoni	23 (20.9%)	53 (28.2%)	74 (30.2%)	150 (27.6%)	
Lomwe	23 (20.9%)	37 (19.7%)	38 (15.5%)	98 (18.%)	
Others	20 (18.2%)	45 (23.9%)	57 (23.3%)	122 (22.5%)	

Note: All proportions are presented in terms of % within column and have been approximated to one decimal place.

5.3.2 Household characteristics

This study defined a household as a group of people, related or unrelated, living in the same dwelling unit and undertaking various arrangements, such as food consumption, together. Results under household characteristics therefore entail description of: people in the household (e.g. head of household, household size); their dwelling unit and its associated structural imperatives such as sanitation technology used. Essentially this presents characteristics of households from which study participants emerged.

Household characteristics are presented in table 5.2 below. The average household size constituted of five (5) persons (SD ± 2; range 2 – 14, median 5, mode 4) who lived in houses with two rooms on average. On average, households had one (1.3) child under the age of five years (SD ± 0.51; range 1 – 5). Household ownership of a toilet was reported by 302 (55.7%) of respondents. The majority of households (75%) shared a toilet with other households and up to 53% of the households shared a toilet with three or more other households, reflecting inadequate sanitation.

Unlike, participant characteristics, some household characteristics were associated with the study setting as the chi-square values in table 5.2 indicate. For example, with regard to distance to health facility (expressed as travel time in terms of the time it takes to walk from care givers' home to the health facility), the mean was 61 minutes (SD ± 45; range 3 – 240, median 45). Participants from households in Ntandire are the furthest from a health facility as the majority (50%) walk for more than an hour and Mgona participants are relatively closer to the health facility as almost all (97%) walk for less than an hour to the health facility. The wealth levels however, demonstrate homogeneity among households in all three areas.

Table 5.2: Household characteristics

Household characteristics	Senti N = 110	Mgona N = 188	Ntandire N = 245	Total N = 543	P Value
Paternal education level					
No education/Junior Primary	14(12.7%)	37 (19.7%)	26 (14.2%)	77(14.2%)	0.11
Senior Primary	36 (32.7%)	60 (31.9%)	83 (33.9%)	179 (33%)	
Secondary and above	60 (54.5%)	90 (47.9%)	136 (55.5%)	287 (52.7%)	
Household wealth					
Low	33 (30%)	71 (37.8%)	79 (32.2%)	183 (33.7%)	0.57
Average	37 (33.6%)	62 (33%)	81 (33.1%)	180 (33.1%)	
High	40 (36.4%)	55 (29.3%)	85 (34.7%)	180 (33.1%)	
Ownership of toilet (%)					
Yes	96 (87.3%)	67 (35.6%)	139 (56.7%)	302 (55.6%)	0.000
No	14 (12.7%)	121 (64.4%)	106 (43.3%)	241 (44.4%)	
Households using one toilet					
One	34 (30.9%)	32 (17.%)	70 (28.6%)	136 (25.%)	
Two	18 (16.4%)	34 (18.1%)	69 (28.2%)	121 (22.3%)	
Three	20 (18.2%)	31 (16.5%)	42 (17.1%)	93 (17.1%)	0.001
Four	16 (14.5%)	36 (19.1%)	29 (11.8%)	81 (14.9%)	
Five +	22 (20%)	55 (28.2%)	35 (14.3%)	112 (19.9%)	
Distance (Travel time) to facility					
≤ 30 Minutes	35 (31.8%)	117 (62.2%)	49 (20%)	201 (37%)	
31 – 60 Minutes	59 (53.6%)	64 (34%)	74 (30.2%)	197 (36.3%)	0.000
> 60 Minutes	16 (14.5%)	7 (3.7%)	122 (49.8%)	145 (26.7%)	

Note: *All proportions are presented in terms of % within column (slum name) and have been approximated to one decimal place.*

5.3.3 Under-five child morbidity patterns at baseline

Care givers were asked if the child had an illness episode in the three months preceding the date of interview. The majority of caregivers, 461 (85%) reported a childhood illness episode. Patterns of morbidity indicate that fever was the most prevalent (77%), followed by respiratory symptoms of cough (71%); diarrhoea (42%) and Acute Respiratory Infection (ARI) symptoms characterised by coughing and fast breathing (36%).

Co-morbidity among symptoms of interest (fever, diarrhoea and ARI) was also noted among 59 (12.8%) for fever, diarrhoea and ARI symptom combination; 110 (23.8%) for fever and diarrhoea; and 127 (27.5%) for fever and ARI symptoms.

A Pearson Chi-square test for independence was performed to detect if there were associations between childhood morbidity (any childhood illness; fever; diarrhoea and ARI symptoms) with selected independent variables. Results of patterns of childhood morbidity for any illness symptom and as disaggregated by three illness symptoms of fever, diarrhoea and ARI across characteristics of study participants are presented in Table 5.3. Significance level was set at 10% ($P \leq 0.10$).

The results indicate that age of a child is associated with any childhood morbidity *($P < 0.01$)* with the greatest burden of childhood illness among children aged 12-24 months. Age of the child is also associated with diarrhoea morbidity *($P < 0.001$)* and the association suggests a higher morbidity among younger children (1 to 24 months). Factors such as social capital of care giver, care giver's tribe and parity indicate an association *($P < 0.10$)* with childhood fever. Birth order of the index child was also associated with ARI symptoms suggesting that index children of the first birth order (first born) were likely to have ARI symptoms *($P < 0.05$)* than their counterparts of a higher birth order. Education level of care giver also showed some weak association with Acute Respiratory Infection (ARI) symptoms *($P < 0.10$)*. Other variables, such as care giver's: slum residence; age; autonomy; household size; did not show any association with childhood morbidity.

Table 5.3: Chi-square test of independence for childhood morbidity patterns for any illness, fever, diarrhoea, and cough by selected socio-demographic characteristics

Respondent characteristics	Any illness episode N = 460 (100%)	P Value	Fever N = 354 (%)	P Value	Diarrhoea N = 194 (%)	P Value	ARI N = 132 (%)	P Value
Slum name		0.85		0.36		0.21		0.92
Senti	95 (86.4%)		78 (82.1%)		47 (49.5%)		28 (37.3%)	
Mgona	160 (85.1%)		119 (74.4%)		61 (38.4%)		43 (37.1%)	
Ntandire	206 (84%)		158 (76.7%)		86 (41.7%)		61 (35.1%)	
Age of children (in months)		0.008		0.54		0.000		0.33
1 - 11	89 (78.1%)		66 (74.2%)		39 (43.8%)		29 (42.6%)	
12 - 23	117 (93.6%)		95 (81.2%)		70 (59.8%)		36 (40%)	
24 - 36	137 (84.6%)		102 (74.5%)		48 (35%)		38 (38.6%)	
37 - 53	118 (83.1%)		92 (78%)		37 (31.4%)		29 (29%)	
Age of care givers (years)	200 (86.2%)	0.75	147 (73.5%)	0.25	92 (46.2%)	0.25	59 (36.4%)	0.77
16 – 25	132 (83.5%)		107 (81.1%)		54 (40.9%)		38 (38.4%)	
26 – 30	129 (84.3%)		101 (78.3%)		48 (37.2%)		35 (33.7%)	
≥ 31								
Education level of care givers		0.69		0.63		0.42		0.09*
No educ/Junior Primary	104 (82.5%)		78 (75%)		44 (42.3%)		24 (28.6%)	
Senior Primary	219 (85.9%)		173 (79%)		98 (44.7%)		75 (41.4%)	
Secondary and above	138 (85.2%)		104 (75.4%)		52 (37.7%)		33 (32.7%)	
Social Capital		0.66		0.09*		0.26		0.56
Low	185 (84.1%)		135 (73%)		72 (38.9%)		49 (34.3%)	
High	276 (85.4%)		220 (79.7%)		122 (44.2%)		83 (37.2%)	
Autonomy of care givers		0.43		0.29		0.89		0.45
Low autonomy	182 (86.7%)		135 (74.2%)		78 (42.9%)		56 (38.9%)	
High autonomy	279 (83.8%)		220 (78.9%)		116 (41.7%)		76 (34.4%)	
Maternal Tribe		0.73		0.08*		0.34		0.78
Chewa	150 (86.7%)		123 (82%)		60 (40%)		46 (37.7%)	
Ngoni	128 (85.3%)		100 (78.1%)		52 (40.9%)		38 (36.9%)	
Lomwe	83 (84.7%)		64 (77%)		32 (38.6%)		25 (37.9%)	
Others	100 (82.%)		68 (68%)		50 (50%)		23 (31.1%)	

Birth order of index child	118 (85.5%)	0.97	83 (70.3%)	0.14	56 (47.5%)	0.38	43 (46.2%)	0.03**
First	111 (84.7%)		88 (79.3%)		46 (41.8%)		23 (27.7%)	
Second	232 (84.7%)		184 (79.3%)		92 (39.7%)		66 (34.9%)	
Third or higher								
Parity		0.33		0.10*		0.19		0.32
≤ 2	210 (86.8%)		154 (73.3%)		96 (45.7%)		62 (39%)	
≥ 3	251 (83.4%)		201 (80.1%)		98 (39.2%)		70 (34%)	
Education of household head								
No educ/Junior Primary	66 (85.7%)	0.67	45 (68.2%)	0.13	28 (42.4%)	0.72	13 (25.5%)	0.23
Senior Primary	155 (86.6%)		125 (80.6%)		69 (44.5%)		47 (37%)	
Secondary and above	240 (83.6%)		185 (77.1%)		97 (40.4%)		72 (38.3%)	
Household size (# of people)	111 (24%)		83 (23.4%)		50 (25.8%)		40 (30.3%)	
≤ 3 people	119 (25.8%)		90 (25.4%)		52 (26.8%)		29 (22%)	
4 people	231 (50.2%)		182 (51.3%)		92 (47.4%)		63 (47.7%)	
≥ 5 people								
Distance to nearest facility (walking)		0.47		0.13		0.51		0.42
≤ 30 Minutes	169 (84.1%)		133 (78.7%)		68 (40.5%)		43 (33.9%)	
31 – 60 Minutes	172 (87.3%)		124 (72.1%)		70 (40.7%)		55 (40.4%)	
> 60 Minutes	25 (17.5%)		98 (81.7%)		56 (46.7%)		34 (33.3%)	
Household wealth		0.12		0.60		0.91		0.62
Low	158 (86.3%)		118 (74.7%)		66 (41.8%)		41 (34.7%)	
Middle	145 (80.6%)		114 (78.6%)		63 (43.4%)		46 (34.7%)	
High	158 (87.8%)		123 (77.8%)		65 (41.1%)		45 (34.1%)	

Note: *- All proportions are presented in terms of % within row and have been approximated to one decimal place.*

5.3.4 Factors associated with health care seeking, timeliness in care seeking, and knowledge of child danger signs at baseline.

In order to identify factors associated with health care seeking, timely care seeking, and knowledge of child danger signs, binary logistic regression analyses were conducted using steps described in section 5.2.6.2 for baseline data analysis. Factors included in the analysis constituted: care giver factors (age; tribe; slum residence; parity; education level; autonomy and social capital); child factors (age and birth order); child illness factors (child illness symptoms such as fever, diarrhoea, ARI; perceived severity; and home management of illness); and household factors (distance to nearest most used health facility, paternal education, and household wealth).

Table 5.4 presents descriptive statistics (frequency counts and proportions) and logistic regression results for the three dependent variables of: care seeking from a biomedical health provider, timeliness in care seeking, and knowledge of child danger signs. Subsequent sections present univariate and multivariate binary logistic regression results for factors associated with the three dependent variables at baseline of this longitudinal cohort study design. Brief descriptive statistics precede regression results for each dependent variable.

5.3.4.1 Factors associated with health care seeking from a biomedical health provider at baseline

The majority of care givers, 281 (61%) sought health care from a health facility at baseline. Public health facilities were the most utilised with an aggregate of 85.7% (health centre, 68.9%; central hospital, 11.1% and district hospital, 5.7%) with a small proportion, 6.8% utilising private health facilities, and the remainder using faith based health facilities and outreach clinics set by public and faith based health providers. Provider switching which entails seeking care from two or more health providers for the same illness episode was reported by only 10.4% of care givers who sought care.

From univariate binary logistic regression analyses, seven factors were found to be significantly associated with seeking health care from a biomedical health provider in the event of childhood illness. The following three factors positively influenced care seeking from a biomedical health provider: higher education level of the care giver *(OR = 2.27; 95% CI: 1.52 – 4.48; P < 0.05);* child illness severity *(OR = 2.44; 95% CI: 1.40 – 4.24; P < 0.001)*; and having fever episode *(OR = 1.71; 95% CI: 1.10 – 2.64; P < 0.01).* Four factors were negatively associated with care seeking and they include: older age of the child *(OR = 0.43; 95% CI: 0.24 – 0.77; P < 0.01);* increasing parity of care giver *(OR = 0.90; 95% CI: 0.81 – 0.99; P < 0.05);* slum residence in Ntandire *(OR = 0.51; 95% CI: 0.30 – 0.86; P < 0.05);* and undertaking home management of childhood illness *(OR = 0.55; 95% CI: 0.38 – 0.92; P < 0.01).*

5.3.4.2 Factors associated with timely care seeking at baseline

As cited earlier, health care seeking was classified as sought timely when care givers reported taking the sick child to a biomedical health provider within forty eight (48) hours of onset of symptoms and late care seeking when sought outside 48 hours. The baseline findings indicate that 53% of care givers sought care timely.

From univariate binary logistic regression analyses, all the three statistically significant factors were negatively associated with timely care seeking from a biomedical health provider and they include: residence in Ntandire *(OR =0.49; 95% CI: 0.27 – 0.91; P < 0.01);* longer walking distance to health facility (more than one hour) *(OR = 0.35; 95% CI: 0.19 – 0.65; P < 0.01*); and home management of childhood illness *(OR = 0.42; 95% CI: 0.26 – 0.67; P < 0.01*).

5.3.4.3 Factors associated with knowledge of child danger signs at baseline

Baseline findings indicate that the majority of care givers, 399 (73.6%) had no to very limited knowledge of child danger signs. As shown in table 5.4, slum residence, care giver's autonomy, care giver's social capital, age of the child, and perceived severity of childhood illness are the factors significantly associated with knowledge of child danger signs in univariate logistic regression analyses.

Specifically, factors that were positively associated with knowledge of child danger signs include: care givers with high autonomy *(OR = 4.64; 95% CI: 2.85 – 7.55; P < 0.001*); care givers with high social capital *(OR =2.34; 95% CI: 1.54 – 3.56; P < 0.001*); and care givers who perceived a childhood illness as more severe *(OR =2.67; 95% CI: 1.39 – 5.15; P < 0.01*). On the other hand residence in Ntandire *(OR =0.58; 95% CI: 0.35 – 0.96; P < 0.05*); and care givers with children in the 25 to 36 months age group *(OR = 0.47; 95% CI: 0.28 – 0.81; P < 0.01*) were negatively associated with knowledge of child danger signs.

Table 5.4: Descriptive statistics and Logistic regression results for factors predicting health care seeking; timeliness in care seeking and knowledge of child danger signs

Respondent characteristics	Health care seeking		Timeliness in care seeking		Knowledge of child danger signs	
	Sought care N = 281 (%)	AOR (95% CI)	Timely care seeking N = 149 (%)	AOR (95% CI)	Good Knowledge N = 144 (%)	AOR (95% CI)
Slum name						
Senti	68 (71.6%)	1.0	40 (58.8%)	1.0	36 (32.7%)	1.0
Mgona	97 (60.6%)	0.61 (0.35-1.05)	61 (62.9%)	1.19 (0.63 – 2.4)	54 (28.7%)	0.83 (0.50 - 1.37)
Ntandire	116 (56.3%)	0.51 (0.30-0.86)**	48 (41.4%)	0.49 (0.27 - 0.91)***	54 (22%)	0.58 (0.35 – 0.96)**
Age of care giver (years)						
16 – 25	129 64.5%)	1.0	69 (53.5%	1.0	63 (27.2%)	1.0
26 – 30	86 (65.2%)	1.03 (0.65 - 1.63)	44 (51.2%)	0.91 (0.53 - 1.57)	41 (25.9%)	0.94 (0.59 - 1.49)
≥ 31	66 (51.2%)	0.58 (0.37–0.91)**	36 (54.5%)	1.04 (0.58 - 1.89)	40 (26.1%)	0.95 (0.60 - 1.51)
Education of care giver						
No education/Junior Primary	57 (54.8%)	1.0	30 (52.6%)	1.0	37 (29.4%)	1.0
Senior Primary	141 (64.4%)	2.27 (1.52–4.48)**	75 (53.2%)	1.30 (0.48 – 3.52)	62 (24.3%)	0.71 (0.37 - 1.35)
Secondary +	83 (60.1%)	1.95 (0.95 – 4.00)^{X}	44 (53%)	1.26 (0.36 – 3.61)	45 (27.8%)	0.82 (0.41 - 1.62)
Autonomy						
Low	107 (58.8%)	1.0	54 (50.5%)	1.0	23 (11%)	1.0
High	174 (62.4%)	1.16 (0.79-1.70)	95 (54.6%)	1.18 (0.73 – 1.91)	121 (36.3%)	4.64 (2.85-7.55)****
Social Capital score						
Low	108 (58.4%)	1.0	59 (54.6%)	1.0	38 (17.3%)	1.0
High	173 (62.7%)	1.20 (0.82-1.75)	90 (52%)	0.90 (0.56 - 1.46)	106 (32.8%)	2.34 (1.54-3.56)****
Maternal Tribe						
Chewa	94 (62.7%)	1.0	47 (50%)	1.0	53 (30.6%)	1.0
Ngoni	74 (57.8%)	0.82 (0.50 - 1.32)	41 (55%)	1.24 (0.67 – 2.29)	32 (21.3%)	0.61 (0.37 - 1.02)^{X}
Lomwe	53 (63.9%)	1.05 (0.60 - 1.84)	30 (56.6%)	1.30 (0.66 - 2.56)	25 (25.5%)	0.78 (0.44 - 1.35)
Others	60 (60%)	0.89 (0.53 - 1.50)	31 (51.7%)	1.06 (0.56 - 2.04)	34 (27.9%)	0.86 (0.53 - 1.46)
Age of child (months)						
1 – 11	64 (71.9%)	1.0	35 (54.7%)	1.0	40 (35.1%)	1.0
12 – 23	73 (62.4%)	0.65 (0.36 - 1.18)	42 (57.5%)	1.12 (0.57 - 2.21)	37 (29.6%)	0.78 (0.45 - 1.34)
24 – 36	82 (59.9%)	0.58 (0.33 - 1.04)^{X}	39 (47.6%)	0.75 (0.39 - 1.45)	33 (20.4%)	0.47 (0.28 – 0.81)***
37 - 53	62 (52.5%)	0.43 (0.24-0.77)***	33 (53.2%)	0.94 (0.47 – 1.90)	34 (23.9%)	0.58 (0.34 – 1.00)^{X}
Knowledge of danger signs						
No/little knowledge	202 (58.6%)	1.0	112 (55.4%)	1.0	NA	NA
Knowledgeable	79 (68.1%)	1.51 (0.97 - 2.36)^{X}	37 (46.8%)	0.71 (0.42 – 1.19)*		

Home management of illness						
No	145 (68.4%)	1.0	92 (63.4%)	1.0	59 (27.8%)	1.0
Yes	136 (54.6%)	0.55 (0.38-0.92)***	57 (41.9%)	0.42 (0.26- 0.67)****	57 (22.9%)	0.77 (0.51-1.17)
Distance to HF (minutes)						
<= 30	102 (60.4%)	1.0	61 (59.8%)	1.0	55 (27.4%)	1.0
31 – 60	106 (61.6%)	1.05 (0.68 - 1.63)	63 (59.4%)	0.99 (0.57 - 1.71)	57 (28.9%)	1.08 (0.70 - 1.67)
=> 60	73 (60.8%)	1.02 (0.63 - 1.55)	25 (34.2%)	0.35 (0.19-0.65)***	32 (22.1%)	0.75 (0.92 –1.24)
Education of HH						
No education	43 (65.2%)	1.0	22 (51.2%)	1.0	20 (26%)	1.0
Primary	93 (60%)	1.23 (0.58 – 2.59)	44 (47.3%)	0.81 (0.30 - 2.14)	44 (24.6%)	1.72 (0.72 – 4.10)
Secondary +	144 (60.4%)	1.12 (0.35 – 2.34)	83 (57.2%)	1.22 (0.47 - 3.19)	80 (27.9%)	1.80 (0.77 – 4.23)
Household wealth						
Low	100 (63.3%)	1.0	54 (54%)	1.0	50 (27.3%)	1.0
Medium	86 (59.3%)	0.85 (0.53 - 1.34)	50 (58.1%)	1.18 (0.66 - 2.12)	45 (25%)	0.89 (0.56 – 1.42)
High	95 (60.1%)	0.87 (0.55 - 1.37)	45 (47.4%)	0.77 (0.44 - 1.35)	49 (27.2%)	1.00 (0.63 – 1.58)
Perceived severity of illness						
Minor	45 (51.7%)	1.0	26 (57.8%)	1.0	13 (14.9%)	1.0
Moderate	126 (56.8%)	1.22 (0.74 - 2.01)	68 (54%)	0.86 (0.43 – 1.75)	71 (32%)	2.67 (1.39 – 5.15)***
Severe	110 (72.4%)	2.44(1.4-4.24)****	55 (50.%)	0.73 (0.36 - 1.47)	32 (21.1%)	1.52 (0.75 - 3.07)
Education on danger signs						
Not received education	48 (55.2%)	1.0	24 (50%)	1.0	22 (22%)	1.0
Ever received education	220 (62.5%)	1.35 (0.84 - 2.18)	120 (54.5%)	1.20 (0.64 – 2.24)	117 (28.2%)	1.39 (0.83 – 2.34)
Fever						
No	54 (50.9%)	1.0	26 (48.1%)	1.0	27 (25.5%)	
Yes	227 (63.9%)	1.71 (1.10-2.64)***	123 (54.2%)	1.27 (0.70 – 2.31)	89 (25.1%)	
Diarrhoea						
No	153 (57.3%)	1.0	76 (49.7%)	1.0	65 (24.3%)	
Yes	128 (66%)	1.45 (0.96 - 2.12)^{X}	73 (57%)	1.35 (0.83 – 2.16)	51 (26.3%)	
ARI						
No	128 (54.7%)	1.0	66 (51.6%)	1.0	68 (29.1%)	
Yes	83 (62.9%)	1.40 (0.90 – 2.17)	39 (47%)	0.83 (0.47 – 1.45)	23 (17.4%)	
Parity		0.90 (0.81–0.99)**		1/02 (0.90 - 1.17)		1.05 (0.94 – 1.17)
Child birth order		0.92 (0.82 - 1.02)		1.04 (0.90 - 1.20)		1.03 (0.93 – 1.13)

Note: $^{X}= p < 0.10$, **= $p < 0.05$, *** $p < 0.01$, ****= $p < 0.001$

5.3.5 Factors associated with health care seeking, timely care seeking and knowledge of danger signs at baseline (multivariate logistic regression)

A multivariate logistic regression was performed for all three dependent variables following steps described in section 5.2.6.2 under baseline data analysis. Factors with *p* values ≤ 0.10 in logistic regression models reported in table 5.4 were retained. The results of a multivariate logistic regression analysis are presented in table 5.5 below.

5.3.5.1 Factors associated with care seeking from a biomedical health provider

As table 5.5 indicates, ten factors were included in the multivariate logistic regression model to determine predictors of care seeking from a biomedical health provider. The full model was statistically significant, $x^2\ (\mathrm{N} = 461) = 54.11,\ p < 0.001$. With the exception of parity (which suggested less likelihood of seeking care with increasing care givers parity) and education level of the care giver, the other five factors retained statistical significance.

Care givers who perceived their child's illness as severe (72.2%) were more than twice likely to seek health care than their counterparts who perceived their child's illness as minor (51.7%) (*AOR = 2.40; 95% CI: 1.34 – 4.30; P < 0.01).* However there was no significant difference in care seeking between care givers who perceived their child's illness to be minor and those who perceived it to be moderately severe. With regard to childhood illness symptoms, fever symptoms were significantly associated with care seeking (*AOR = 1.77; 95% CI: 1.10 – 2.86; P < 0.05)* suggesting that a child with fever was about twice as likely to be taken to a biomedical health provider than the one who exhibited other morbidity symptoms.

Health care seeking was highest for the youngest age group of children (1 – 11 months) (71.9%) and steadily declined afterwards reaching 52.5% for the children aged 37 to 53 months (*AOR = 0.54; 95% CI: 0.30 – 0.99; P < 0.05).* Slum residence was also significantly associated with health care seeking, in that, compared to Senti (71.6%), care givers from Ntandire (56.3%) were less likely to seek health care for their children (*AOR = 0.56; 95% CI: 0.32 – 0.98; P < 0.05).* Similarly, provision of home management for a sick child was strongly and negatively associated with care seeking from a biomedical health provider as care givers who had reported to have provided home management to their ill children were less likely to take them to a health facility compared to their counterparts who had not provided any home management (*AOR = 0.54; 95% CI: 0.36 – 0.81; P < 0.01).* Home management of childhood

illness and perceived severity of childhood illness demonstrated the largest impact on care seeking of child health services.

5.3.5.2 Factors associated with timely care seeking from a biomedical health provider

A multivariate logistic regression model for predictors of timely care seeking included six independent variables. The full model was statistically significant, x^2 (N = 281) = 30.90, $p < 0.01$. Whilst slum residence and distance to health facility lost statistical significance, knowledge of child danger signs emerged as a statistically significant factor.

An inverse significant association was noted between home management of childhood illness and timely care seeking, suggesting that care givers who reported to have undertaken home management for their ill children were less likely to seek care timely (*AOR = 0.44; 95% CI: 0.27 – 0.74; P < 0.01).* Likewise, care givers with good knowledge of child danger signs were less likely to seek health care from a biomedical health provider in a timely manner (*AOR = 0.57; 95% CI: 0.33 – 0.99; P < 0.05).*

5.3.5.3 Factors associated with knowledge of child danger signs

Eight factors were included in a multivariate logistic regression model (see table 5.5) to determine predictors of knowledge of child danger signs. The full model was statistically significant, x^2 (N = 543) = 64.95, $p < 0.001$). Of the eight factors in the model, four, emerged to be statistically significant.

Autonomy of care givers has a strong significant positive association with knowledge of child danger signs. The results entail that care givers with high autonomy score were approximately four times more likely to have good knowledge of child danger signs than their counterparts with low autonomy score (*AOR = 3.84; 95% CI: 2.17 – 6.76; P < 0.001)*. Compared to care givers with a low social capital, those with a high social capital score were two times more likely to possess good knowledge of child danger signs (*AOR = 2.10; 95% CI: 1.25 – 3.54; P < 0.01).* Similarly, care givers who perceived their child's illness as moderately severe were approximately two and half times more likely to have good knowledge of child danger signs relative to those who perceived childhood illness as minor (*AOR = 2.44; 95% CI: 1.19 – 4.97; P < 0.01)* and there was no difference between those who perceived childhood illness as minor and those who perceived it a severe.

Care givers from Ntandire were less likely to possess good knowledge of child danger signs in comparison with those from Senti (*AOR = 0.50; 95% CI: 0.25 – 0.97; P < 0.05)* whereas there was no statistically significant difference between care givers from Senti and Mgona. Furthermore, compared to care givers with children under the age of 12 months, care givers with children in the 25 – 36 months age group, were less likely to be knowledgeable about child danger signs (*AOR = 0.51; 95% CI: 0.26 – 0.98; P < 0.05).* Of all factors in the model autonomy of care giver registered the greatest influence.

Table 5.5: Multivariate logistic regression results of factors associated with care seeking from a health provider, timely care seeking and knowledge of child danger signs

Respondent characteristics	Care seeking	Timely care seeking	Knowledge of child danger signs
	Adjusted OR (95% CI)	**Adjusted OR (95% CI)**	**Adjusted OR (95% CI)**
Slum name			
Senti	1.0	1.0	1.0
Mgona	0.64 (0.36 -1.14)	0.92 (0.45 - 1.85)	0.70 (0.37 - 1.33)
Ntandire	0.56 (0.32 -0.98)*	0.59 (0.29 - 1.19)	0.50 (0.25 - 0.97)*
Care giver's education			
No education/adult literacy	1.0	1.0	1.0
Primary	1.82 (0.84 – 3.91)	1.21 (0.41 – 3.54)	0.51 (0.25 – 1.26)
Secondary +	1.55 (0.67 – 3.61)	1.17 (0.38 – 3.59)	0.61 (0.26 – 1.42)
Age of care giver			
16 - 25	1.0	NA	NA
26 – 30	1.20 (0.71 – 2.02)		
≥ 31	0.85 (0.44 – 1.64)		
Autonomy of care givers			
Low autonomy	NA	NA	1.0
High autonomy			3.84 (2.17 - 6.76)***
Social Capital			
Low	NA	NA	1.0
High			2.10 (1.25 - 3.54)**
Age of children (in months)			
1 – 11	1.0	1.O	1.0
12 – 23	0.60 (0.32 - 1.14)	0.96 (0.46 – 2.00)	0.92 (0.47 - 1.80)
24 – 36	0.68 (0.37 - 1.27)	0.69 (0.34 – 1.41)	0.51 (0.26 - 0.98)*
37 - 53	0.54 (0.30 – 0.99)*	1.02 (0.48 – 2.15)	0.79 (0.40 - 1.54)
Knowledge of danger signs			
No/little knowledge	1.0	1.0	
Knowledgeable	1.52 (0.94 – 2.47)	0.57 (0.33 – 0.99)*	NA
Received health education on danger signs			
No	NA	NA	1.0
Yes			1.20 (0.64 – 2.22)
Home management of illness undertaken			
No	1.0	1.0	NA
Yes	0.54 (0.36 - 0.81)**	0.44 (0.27 - 0.74)**	

Distance to nearest facility (walking minutes)	NA		
≤ 30 Minutes		1.0	1.0
31 – 60 Minutes		1.12 (0.62 – 2.04)	1.14 (0.66 – 1.98)
> 60 Minutes		0.53 (0.25 – 1.15)	0.98 (0.48 – 2.03)
Perceived illness severity			
Minor	1.0		1.0
Moderate	1.17 (0.69 - 2.00)	NA	2.44 (1.19 – 4.97)*
Severe	2.40 (1.34 - 4.30)**		1.18 (0.55 - 2.53)
Fever			
No	1.0	NA	NA
Yes	1.77 (1.10 - 2.86)*		
Diarrhoea			
No	1.0	NA	NA
Yes	1.28 (0.84 – 1.97)		
Parity of mother			
Parity	0.94 (0.81 – 1.08)	NA	NA
Child birth order			
Birth order	NA	NA	NA

Note: * = p <0.05, ** = p <0.01, *** = p <0.001;
1.0 represents a reference category.
NA entails not applicable for a multivariate logistic regression for a particular dependent variable

5.3.6 Home management of childhood illnesses at baseline

Initial response to childhood illnesses at home represents one of the key elements of child care in the event of an illness. The study therefore sought to find out if any form of home management was undertaken for childhood morbidity. The findings suggest that of the 461 care givers who had reported childhood morbidity, 249 (54%) reported to have provided home management. Almost all care givers (98%) who reported to have provided home management for their sick child used western medicine. Local shops/groceries were the commonly cited source of the medicine (83.1%) for home management with about 8% reporting to have used medicine that had remained from their previous dosage obtained from a health facility when they had sought care for their children, 4% reported to have bought from pharmacy, 2% obtained from a friend, neighbour or relative.

Slightly more than half (54.2%) of care givers who had undertaken home management for childhood illness reported to have initiated home management the same day they noticed symptoms of childhood illness. Others reported undertaking home management the next day (23.3%), after a day (3.2%), and after two days (19.2%) of onset of childhood illness symptoms.

5.3.7 Reasons for not seeking care outside home at baseline

Care givers who reported not to have sought care outside home were asked for reasons for their decision. The commonly cited reasons include as follows:

Did not think that the illness was severe enough (43.9%)

Lack of money to pay for transport or other associated health care cost (17.2%)

Advised by peers or elders to wait (12.2%)

Distance to health facility is far and could not manage to walk at the time (7.8%)

5.3.8 Perception of quality of child health care services at most used health facilities

Care givers were also asked for their perception of quality of health care provided to under-five children from their most utilised health facility. The perceived quality of care rating was provided through a five point likert scale ranging from very good to very bad with a middle point classified as fair. The results (N = 537) indicated a rating of very good (14.4%), good (26.5%), fair (40.9%), bad (16.6%), and very bad (1.6%) of care givers.

Furthermore, care givers were asked to cite what constitutes good health care for their under-five children. Various unprompted (i.e. options were not read out to respondents to choose, rather they emerged from respondents themselves) factors emerged. The salient factors include the following:

Availability of medicines and supplies at all times (92.1%)

Good attitude of health workers (61.7%)

Convenient opening times (37%)

Minimal waiting time (17.7%)

Undertaking home and community visits (17.3%)

General cleanliness of the hospital premises (13.3%)

Some of the factors above were considered important health system factors with potential to influence care seeking decisions and were thus included as attributes in the DCE study design as will be elucidated in chapter 7.

5.3.9 Summary of baseline results

Results of baseline data (t0) collected from 543 care givers between January to early March, 2012, showed the following:

- Almost all primary care givers (98.3%) were females, as per sociocultural context signifying feminine gender roles.
- The average age of children was 26 months and on average the index child for the study was of the third birth order.
- The majority of care givers were classified to be highly autonomous (61.3%) as per autonomy score derived from questions on key decision making powers.
- The majority of care givers had a high social capital score (62.1%) derived from social networking questions.
- The individual care givers characteristics were not significantly different across the three study settings suggesting homogeneity at slum level.
- Some household characteristics such as distance to nearest most utilised health facility, ownership of toilet and number of households using one toilet were significantly different among study setting. Ntandire was noted to be the farthest from a health facility and Mgona was the worst on sanitation related characteristics. However, household wealth was fairly homogeneous across the three study settings.
- A high burden of childhood morbidity was noted in the three months preceding the baseline survey as 85% of children had an illness episode. Similarly, fever constituted the most prevalent childhood illness symptom (77%) followed by cough (71%), diarrhoea (42%) and Acute Respiratory Infection symptoms (27.2%).
- Age of the child was associated with childhood morbidity in that younger children were more likely to have an illness.
- Care seeking for childhood illness from a biomedical health provider was undertaken by 61% of care givers. Public health facilities constituted the commonest source of child health care, albeit care givers had quality concerns as only 41% rated them as providing either very good or good quality of health care.
- Logistic regression analysis showed that older age of a child, undertaking home management of childhood illness, and slum residence in Ntandire were negatively associated with health care seeking. Childhood illnesses perceived to be more severe and child manifesting symptoms of fever were positively associated with care seeking from a biomedical health provider.

- Good knowledge of child danger signs and undertaking home management of childhood illness negatively predicted timely care seeking from a biomedical health provider in a logistic regression
- High care givers' autonomy, perceived severity of childhood illness and high social capital positively predicted good knowledge of child danger signs. Slum residence in Ntandire, and having a child in the age range of 24 – 36 months were negatively associated with good knowledge of danger signs.
- Home management of childhood illness was undertaken by 54% of care givers.

5.3.10 Results of longitudinal observations (follow up results)

The subsequent sections present longitudinal analysis results (from baseline to second follow up) of the longitudinal study. The initial step to undertaking longitudinal analysis was to determine loss to follow up over the study duration and detect if there was a systematic attrition which could have resulted in selectivity in non-response. Thus the care giver's retention/attrition analysis is presented in the first part of this section. The second part provides a descriptive analysis of the three dependent variables in both aggregate terms and by selected care giver, child and childhood morbidity characteristics at t1 and t2. The third part presents generalised linear mixed regression models to determine factors significantly associated with each of the dependent variables over the entire study period.

5.3.11 Retention status and comparison of characteristics of care givers retained for the entire study period and those lost to follow up.

As indicated in baseline findings earlier in section 5.3.1, a total of 543 care givers of under-five children constituted sample for the study. A detailed explanation of attrition including reasons at each stage has been provided earlier in section 5.2.5.

However, some people who were lost to follow up at t1 were identified in t2 implying that there are care givers who provided data at baseline and t2 only. This resulted in a situation where not all of the 442 care givers available in t2 had provided data in the preceding t1. A total of 427 care givers, representing 79% of the sample size at baseline, presented data in all three time points, ultimately resulting in a total of 116 care givers who had not provided data at either t1, t2 or both t1 and t2.

A Pearson's chi-square test was conducted to determine if loss to follow up was associated with particular characteristics of care givers hence resulting in systematic loss or selective non-response. Table 5.6 provides a comparison in characteristics of care givers retained across the study period and those who were lost to follow up. Retained care givers in this case refer to the 427 who provided data for all the three data collection time points while care givers lost to follow up refer to the 116 care givers who were lost to follow up at either t1 or t2 or both.

Table 5.6: Comparison of care givers that were retained and those lost to follow up

Characteristics at baseline	Follow up data collection points (t1 and t2)				
	Responders (N =427)		Lost to follow up (N = 116)		
	n	%	n	%	P-value
Slum name					
Senti	70	16.4	40	34.5	0.000
Mgona	144	37.7	44	37.9	
Ntandire	213	49.9	32	27.6	
Care giver's age (years)					
16 – 25	176	41.2	56	48.3	0.12
26 – 30	122	28.6	36	31	
≥ 31	129	30.2	24	20.7	
Education of care giver					
No education/Junior primary	109	25.5	17	14.7	0.05
Primary	193	45.2	62	53.4	
Secondary +	125	29.3	37	31.9	
Autonomy of care giver					
Low	163	38.2	47	40.5	0.73
High	264	61.8	69	59.5	
Social capital					
Low	167	39.1	53	45.7	0.24
High	260	60.9	63	54.3	
Care giver's tribe					
Chewa	133	31.1	40	31.9	0.49
Ngoni	117	27.4	33	27.6	
Lomwe	75	17.6	23	18	
Others	102	23.9	20	22.5	
Child's age (months)					
1 – 11	85	19.9	29	25	0.22
12 - 23	93	21.8	32	27.6	
24 – 36	133	31.1	29	25	
37 – 53	116	27.2	22	22.4	
Education level head of household					
No education/Junior Primary	64	15	13	11.2	0.49
Senior Primary	143	33.3	37	31.9	
Secondary +	220	51.8	66	56.9	
Household wealth					
Low	142	33.3	41	35.3	0.78
Medium	142	33.3	38	33.1	
High	143	33.5	37	33.1	

As noted from table 5.6 above, there was no significant difference in almost all the key characteristics of study participants for care givers who were retained and those who were lost to follow up. Only slum residence ($p < 0.001$) suggests a strong statistically significant difference between care givers retained and those lost to follow up. Education of care giver shows a borderline statistical significance ($p = 0.05$).

Data within the study setting suggests a significant loss to follow up for care givers from Senti. Further analysis was therefore undertaken for care givers from Senti to determine if there was a selective attrition within Senti. Results (not shown in the table) indicated that there was no statistically significant difference between care givers retained in the study and those lost to follow up (within Senti). Thus while there was a significant loss to follow up within Senti which contributed to the result suggesting a systematic loss at aggregate slum setting level, individual level characteristics within Senti, indicate that there was no selective loss to follow up. In general, therefore the results indicate that there was no systematic attrition of study participants. Ultimately, selective non-response does not arise in this longitudinal study.

5.3.12 Descriptive results for childhood morbidity, care seeking, timeliness in care seeking and knowledge of child danger signs in the first follow up, t1.

Of the 497 care givers available during t1, 423 (85%) reported an illness episode during the period between baseline and the t1 date of interview. During this time, fever was also the most prevalent childhood illness symptom affecting 72% of under-five children, followed by coughing (47%) and symptoms of Acute Respiratory Infection (41%). Diarrhoea was the least prevalent affecting 25% of the under-five children.

Table 5.7 presents frequency distributions of care seeking from a health provider, timeliness in care seeking and knowledge of child danger signs by selected characteristics of care givers, under-five children and childhood morbidity. With regard to response to childhood morbidity, 271 (64%) reported to have undertaken home management of childhood illness. Health care was sought from a health provider by 275 (65%) of the children reported to have had an illness episode. Of those who reported to have sought care from a health provider, 149 (54.2%) sought it timely. Only 141 (28.4%) of care givers exhibited good knowledge of child danger signs from the unprompted question eliciting knowledge of child danger signs.

Table 5.7: Frequency distribution of care seeking, timeliness in care seeking and knowledge of child danger signs during t1

Respondent characteristics	Care seeking N = 422 (100%)		Timeliness in care seeking N = 281 (100%)		Knowledge of danger signs N = 543 (100%)	
	Sought care N = 281	Did not seek N = 180	Timely seeking N = 149	Late care seeking N = 132	No/Very little N = 399	Good Knowledge N = 144
Slum name						
Senti	64 (75.3%)	21 (24.7%)	37 (57.8%)	27 (42.2%)	67 (69.8%)	29 (30.2%)
Mgona	96 (65.8%)	50 (34.2%)	59 (61.5%)	37 (38.5%)	121 (70.3%)	51 (29.7%)
Ntandire	114 (59.7%)	77 (40.3%)	53 (46.5%)	61 (53.5%)	168 (73.7%)	60 (26.3%)
Education of care giver						
No education/Junior primary	65 (67.7%)	31 (32.3%)	34 (52.3%)	31 (47.7%)	80 (66.7%)	40 (33.3%)
Senior Primary	114 (58.8%)	80 (41.2%)	69 (61.1%)	44 (38.9%)	170 (74.2%)	59 (25.8%)
Secondary +	96 (72.2%)	37 (27.8%)	46 (47.4%)	51 (52.6%)	106 (71.6%)	42 (28.4%)
Age of care giver (years)						
16 – 25	119 (66.1%)	61 (33.9%)	67 (56.3%	52 (43.7%)	155 (73.1%)	57 (26.9%)
26 – 30	83 (70.3%)	35 (29.7%)	43 (51.8%)	40 (48.2%)	102 (72.9%)	38 (27.1%)
≥ 31	72 (58.1%)	52 (41.9%)	39 (54.2%)	33 (45.8%)	99 (68.8%)	45 (31.2%)
Autonomy						
Low	114 (68.3%)	53 (31.7%)	62 (54.9%)	51 (45.1%)	169 (86.7%)	26 (13.3%)
High	160 (62.7%)	95 (37.3%)	87 (54 %)	74 (46%)	187 (62.1%)	114 (37.9%)
Social Capital score						
Low	108 (63.9%)	61 (36.1%)	60 (55.6%)	48 (44.4%)	164 (82.8%)	34 (17.2%)
High	166 (65.6%)	87 (34.4%)	89 (53.6%)	77 (46.4%)	192 (64.4%)	106 (35.6%)
Age of child (months)						
1 – 11	62 (72.9%)	23 (27.1%)	41 (66.1%)	21 (33.9%)	71 (68.9%)	32 (31.1%)
12 – 23	68 (65.4%)	36 (34.6%)	32 (47.1%)	36 (52.9%)	81 (71.7%)	32 (28.3%)
24 – 36	80 (66.1%)	41 (33.9%)	42 (52.5%)	38 (47.5%)	109 (73.6%)	39 (26.4%)
37 - 53	64 (57.1%)	48 (42.9%)	34 (53.1%)	30 (46.9%)	95 (72.%)	37 (28 %)
Distance to HF (minutes)						
<= 30	100 (64.1%)	56 (35.9%)	59 (59 %)	41 (41%)	133 (73.1%)	49 (26.9%)
31 – 60	95 (64.6%)	52 (35.4%)	53 (55.8%)	42 (44.2%)	118 (67.4%)	57 (32.6%)
=> 60	79 (66.4%)	40 (33.6%)	37 (46.8%)	42 (53.2%)	105 (75.5%)	34 (24.5%)
Home management						
No	119 (78.3%)	33 (21.7%)	88 (73.9%)	31 (26.1%)	106 (69.7%)	46 (30.3%)
Yes	156 (57.6%)	115 (42.4%)	61 (39.1%)	95 (60.9%)	194 (71.6%)	77 (28.4%)

5.3.13 Descriptive results for childhood morbidity, care seeking, timeliness in care seeking and knowledge of danger signs in the second follow up, t2

As indicated earlier, a total of 442 care givers were retained at the second follow up data collection point, t2. Of these, childhood morbidity between t1 and t2 time periods was reported for 363 (82%) of the under-five children. Presentation of childhood symptoms of the reported illness episodes mirrored the preceding time points (t0 and t1) in that fever was highest (68%). However diarrhoea, during this period was the second most prevalent (45%) with both coughing and ARI symptoms in third at 34% prevalence.

At this time, home management for childhood illness was reported by 160 (44%) of care givers. A total of 211 (58%) of care givers sought health care from a biomedical health provider for their sick child and 151 (74%) of them sought care in a timely manner.

Among the care givers during t2, 180 (41%) demonstrated good knowledge of child danger signs. Table 5.8 below presents frequency distribution and proportions of care seeking from a health provider, timeliness in care seeking and knowledge of child danger signs by selected care giver, child and illness characteristics

Table 5.8 Frequency distribution of care seeking, timeliness in care seeking and knowledge of child danger signs during t2

Respondent characteristics	Care seeking, N = 362		Timeliness in care seeking, N = 205		Knowledge of danger signs, N = 436 (Missing, N=6)	
	Sought, N=211	Did not N=151	Timely, N = 151	Late, N = 54	No/little, N = 316	Knowledge, N = 120
Slum residence						
Senti	44 (72.1%)	17 (27.9%)	35 (79.5%)	9 (20.5%)	57 (72.1%)	22 (27.8%)
Mgona	74 (56.1%)	58 (43.9%)	57 (83.8%)	11 (16.2%)	95 (65.5%)	50 (34.8%)
Ntandire	93 (55%)	76 (45 %)	59 (63.4%)	34 (36.6%)	164 (77.4%)	48 (22..6%)
Care giver's education						
No education/Junior Primary	56 (58.9%)	39 (41.8%)	47 (83.9%)	9 (16.1%)	76 (73.1%)	28 (26.9%)
Senior Primary	87 (53.7%)	75 (46.3%)	58 (69.9%)	25 (30.1%)	146 (71.6%)	58 (28.4%)
Secondary+	68 (64.8%)	37 (35.2%)	46 (69.7%)	20 (30.3%)	94 (73.4%)	34 (26.6%)
Age of care giver (years)						
16 – 25	81 (57.4%)	60 (42.6%)	60 (75.9%)	19 (24.1%)	131 (72%)	51 (28%)
26 – 30	59 (53.6%)	51 (46.4%)	37 (63.8%)	21 (36.2%)	97 (74%)	34 (26%)
≥ 31	71 (64%)	40 (36%)	54 (79.4%)	14 (20.6%)	89 (71.5%)	35 (28.5%)
Autonomy						
Low	85 (60.7%)	55 (39.3%)	63 (75.9%)	20 (24.1%)	126 (73.7%)	45 (26.3%)
High	126 (56.8%)	96 (43.2%)	88 (72.1 %)	34 (27.9%)	190 (71.7%)	75 (28.3%)
Social Capital score						
Low	85 (57%)	64 (43%)	65 (80.2%)	16 (19.8%)	128 (71.5%)	51 (28.5%)
High	126 (59.2%)	87 (40.8%)	86 (69.4%)	38 (30.6%)	188 (73.2%)	69 (22.8%)
Age of the child (months)						
1 – 11	46 (60.5%)	30 (39.5%)	30 (67.6%)	15 (33.3%)	73 (73.7%)	26 (26.3%)
12 – 23	53 (64.5%)	29 (39.5%)	35 (67.3%)	17 (32.7%)	67 (69.8%)	29 (30.2%)
24 – 36	64 (57.7%)	47 (42.3%)	52 (82.5%)	11 (17.5%)	92 (73.6%)	33 (26.4%)
37 - 53	48 (51.6%)	45 (48.4%)	34 (75.6%)	11 (24.4%)	84 (72.4%)	32 (27.6%)
Perceived severity of illness						
Minor	79 (51.3%)	75 (48.7%)	62 (84.9%)	11 (15.1%)	97 (69.8%)	42 (30.2%)
Moderate	71 (55.5%)	57 (44.5%)	49 (69%)	22 (31%)	81 (71.7%)	32 (28.3%)
Severe	42 (87.5%)	6 (12.5%)	23 (54.8.%)	19 (45.2%)	37 (82.2%)	8 (17.8%)
Distance to HF (minutes)						
<= 30	75 (57.7%)	55 (42.3%)	53 (74.6 %)	18 (25.4%)	114 (72.6%)	43 (27.4%)
31 – 60	70 (54.3%)	59 (45.7%)	51 (75%)	17 (25%)	108 (69.8%)	49 (31.2%)
=> 60	66 (64.1%)	37 (35.9%)	47 (71.7%)	19 (28.8%)	94 (77%)	28 (23%)
Time based care seeking						
None	NA	NA	NA	NA	62 (76.5%)	19 (23.5%)
Once					95 (69.8%)	43 (31.2%)
Twice					111 (72.5%)	42 (27.5%)
Thrice					48 (75%)	16 (25%)

5.3.14 Summary of frequency distributions of childhood morbidity, responses to childhood morbidity and knowledge of danger signs from t0 to t2

Table 5.9 below presents a summary of frequency distributions for childhood morbidity, responses to childhood morbidity (home management, care seeking and timeliness in care seeking) and knowledge of child danger signs over the three data collection points of the study (t0 to t2). As indicated earlier, t0 (baseline) represents data collected from January to early March, 2012; t1 (first follow up) represents data collected from late April to mid-June, 2012; and t2 (second follow up) represents data collected from mid-October to early December, 2012.

As it can be noted, absolute frequencies of childhood morbidity generally reflect a similar declining pattern for both general and symptom specific childhood morbidity. However, diarrhoea prevalence presents a different trend in that it declines from 36% at baseline to 25% at t1 and increases to 45% at t2.

With regard to responses to childhood illness, both home management and care seeking from a health provider show an increase from baseline levels to t2 with t2 registering the lowest levels of both. On the other hand, timely care seeking registers a consistent absolute increase from t0 to t2 even though with a small change between t0 and t1 (53% to 54%) and greater increase between t1 and t2 (54% to 74%). Frequency of knowledge of child danger signs show an almost flat line with a 2% increase from baseline to t1 and a 1% decrease from t1 to t2.

Table 5.9: Proportion of care seeking, timely in care seeking and knowledge of child danger signs from baseline (t0) to second follow up (t2)

Variable	Data collection time points of the prospective study		
	Baseline, N = 543	1st follow up, N = 497	2nd follow up, N=442
Under-five child morbidity (%)			
Childhood illness episode	85	85	82
Fever	77	72	68
Cough	71	47	34
ARI	42	41	34
Diarrhoea	36	25	45
Response to childhood morbidity (%)			
Home management	54	64	44
Care sought from health provider	61	65	58
Timely care seeking	53	54	74
Knowledge of child danger signs (%)			
Good knowledge of danger signs	26	28	27

Note: N in each column only represents total sample size at each stage of data collection and for knowledge of child danger signs, which included the whole sample. Denominators in childhood morbidity and response to childhood morbidity rows vary.

5.3.15 Is there a change in childhood morbidity and home management of childhood illness over time of the longitudinal study?

To determine if there were temporal changes in childhood morbidity and home management of childhood illness, a Cochran's Q test of proportions used to test differences in repeated measures at more than two points was undertaken in SPSS. As indicated in the preceding section 5.3.11, a total of 427 care givers provided data for all the three data collection points from t0 to t2. It is therefore this sample size that provided a complete data set for analysis of repeated measures of childhood morbidity and home management of illness using a Cochran Q test. Table 5.10 below presents results of the Cochran's Q test statistic to determine if there was a statistically significant change in the proportions of childhood morbidity and home management of childhood illness across the three data collection time points (t0-t2).

Table 5.10: Cochran Q test statistic output for comparison of proportions of childhood morbidity and home management of childhood illness over three data collection time points.

Variable	Baseline (t0)		1st follow up (t1)		2nd follow up (t2)		Cochran's Q test value	P value
	Yes	%	Yes	%	Yes	%		
Childhood morbidity (N = 423)	360	85	355	84	346	82	1.95	0.38
Fever (N = 260)	201	77	195	75	173	67	9.06	0.01*
ARI symptoms (N = 219)	82	37	77	35	66	30	2.85	0.24
Diarrhoea (N = 259)	101	39	70	27	112	43	17.15	0.000***
Home management (N=261)	146	56	171	66	120	46	24.23	0.000***

Note: Total sample for this table is 423 of the 427 available in all time points. 4 cases are missing.

As table 5.10 above indicates, there was no significant change in overall childhood morbidity (P = 0.38) over the period of the study. However, symptom specific morbidity for fever *(P<0.05)* and diarrhoea *(P<0.001)* demonstrated strong statistically significant differences over the three data collection time points. Fever episodes at the three data collection time points was most prevalent at baseline (January – March) (77%) while t2 (October – December) registered the highest diarrhoea prevalence (43%) over the three data collection time points. Similarly the proportional differences in home management of childhood illness demonstrated strong statistical significance *(P<0.001).*

Analyses to determine whether there were temporal changes pertaining to the three dependent variables of the longitudinal study were also done and results are presented in the subsequent sections.

5.3.16 Factors associated with care seeking from a health provider, timely in care seeking and knowledge of child danger signs: a longitudinal analysis

In order to determine factors associated with care seeking from a biomedical health provider; timely care seeking and knowledge of child danger signs from the longitudinal data, generalised linear mixed regression models were constructed using R statistical software. Steps and approaches undertaken for longitudinal data analysis have been presented earlier in section 5.2.6.2. Generalised linear mixed regression model results of final models for each of the three dependent variables are presented in table 5.11 below.

Table 5.11: Generalised linear mixed model results for factors associated with care seeking across all three time points of the study

Variable	Health care seeking from health provider AOR (95% CI)	Timeliness in health care seeking AOR (95% CI)	Knowledge of child danger signs AOR (95% CI)
Slum name			
Senti	1.0	1.0	1.0
Mgona	0.62 (0.41 - 0.95)*	1.03 (0.64 - 1.67)	0.73 (0.40 - 1.32)
Ntandire	0.47 (0.31 - 0.73)***	0.54 (0.34 - 0.86)*	0.50 (0.28 - 0.89)*
Education of care giver			
No education/Junior Primary	1.0	1.0	1.0
Senior Primary	1.04 (0.74 - 1.46)	0.94 (0.60 - 1.47)	0.60 (0.35 - 1.03)
Secondary +	1.53 (1.04 - 2.25)*	0.79 (0.49 - 1.28)	0.65 (0.35 - 1.23)
Autonomy			
Low	1.0	NA	1.0
High	0.80 (0.60 - 1.07)		5.74 (3.49 - 9.45)***
Social capital			
Low	NA	NA	1.0
High			2.44 (1.53 - 3.88)***
Age of child (months)			
0 – 11	1.0	1.0	1.0
12 – 24	0.71 (0.47 - 1.09)	0.67 (0.41 - 1.10)	1.17 (0.63 - 2.19)
25 – 36	0.73 (0.48 - 1.09)	0.64 (0.39 - 1.05)	0.65 (0.35 - 1.20)
37 - 54	0.53 (0.35 - 0.80)**	0.85 (0.51 - 1.43)	1.04 (0.56 - 1.93)
Birth order of index child	NA	NA	1.14 (1.00 - 1.29)
Education of household head			
No education/Junior Primary	NA	NA	1.0
Senior Primary			1.40 (0.70 - 2.80)
Secondary +			1.28 (0.65 - 2.54)
Household wealth			
Low	NA	1.0	NA
Middle		0.97 (0.64 - 1.49)	
High		0.75 (0.49 - 1.15)	
Distance to health facility			
Up to 30	1.0	1.0	NA
31 – 60	1.04 (0.75 - 1.44)	1.10 (0.72 – 1.69)	
≥ 61	1.45 (0.97 - 2.16)	0.79 (0.48 – 1.31)	

Perceived severity of illness			
Minor	1.0	1.0	1.0
Moderate	1.58 (1.13 - 2.21)**	0.99 (0.62 - 1.58)	1.86 (1.16 - 2.98)*
Severe	2.91 (1.96 - 4.29)***	0.65 (0.40 - 1.05)	1.37 (0.81 - 2.30)
Fever			
No	1.0	NA	NA
Yes	2.71 (2.00 - 3.68)***		
Home management of child illness			
No	1.0	1.0	NA
Yes	0.38 (0.28 - 0.50)***	0.36 (0.25 - 0.50)***	
Education on child danger signs			
No	1.0	NA	1.0
Yes	1.33 (0.87 - 2.02)		1.21 (0.67 - 2.21)
Knowledge of danger signs			
No/little knowledge	NA	1.0	NA
Good knowledge		0.52 (0.35 - 0.76)***	
Care seeking across time			
None	NA	NA	1.0
Once			1.48 (0.75 - 2.92)
Twice			1.33 (0.67 - 2.64)
Thrice			0.83 (0.37 - 1.86)
Data collection point			
t0 (Jan-March, 2012)	1.0	1.0	1.0
t1 (April-June, 2012)	1.42 (1.04 - 1.95)*	1.13 (0.78 - 1.65)	1.13 (0.77 - 1.66)
t2 (October-Dec, 2012)	1.10 (0.78 - 1.55)	2.23 (1.42 - 3.48)***	1.26 (0.81 - 1.94)

- Significance codes: '***'=$P<0.001$ '**' =$P<0.01$ '*' =$P<0.05$
- 1.0 is reference category.
- All values approximated to two decimal points
- NA denotes 'Not Applicable' for the particular dependent variable's final regression model

5.3.16.1 Factors associated with care seeking from a health provider

As it can be noted from generalised linear mixed regression model results in table 5.11 above, seven factors namely: slum residence; education of care giver; age of the child; severity of childhood illness; home management of childhood illness; having fever symptoms; and data collection point were significantly associated with seeking care from a biomedical health provider in the event of childhood illness.

With regard to slum residence, the results suggest that care givers from Mgona *(AOR =0.62; 95% CI 0.41 – 0.95; P < 0.05*) and Ntandire *(AOR =0.47; 95% CI 0.31 – 0.73; P < 0.001*) were less likely to seek health care from a health provider in the event of childhood illness compared to their counterparts from Senti. Education level of care givers was also significantly associated with care seeking with care givers of secondary or higher education level being more likely to seek care *(AOR =1.53; 95% CI 1.04 – 2.25; P < 0.05*) than those with no or of junior primary education.

Care givers were less likely to take older children to a health provider in the event of childhood morbidity. In this regard, results indicate a statistically significant difference in care seeking for children in the age range of 37 to 53 months *(AOR =0.53; 95% CI 0.35 – 0.80; P < 0.01*) compared to children aged 1 - 11 months. There was no statistically significant difference noted between children in age ranges of 12 - 23 and 24 – 36 months relative to the younger children.

Severity of childhood illness symptoms was also noted as a strong predictor of care seeking in longitudinal analysis. Results indicate that compared to childhood illnesses that were perceived as minor, those perceived to be severe were approximately three times more likely to seek health care from a biomedical provider *(AOR =2.91; 95% CI 1.96 – 3.68; P < 0.001*). Likewise, care givers who perceived their child's illness as moderately severe were more likely to seek health care than those who perceived it to be minor *(AOR =1.58; 95% CI 1.13 – 2.21; P < 0.01*)

Having fever also influenced health care seeking in that children with fever were more than twice as likely to be taken to a health facility than a childhood illness that did not exhibit fever symptoms *(AOR =2.71; 95% CI 2.00 – 3.68; P < 0.001*). Undertaking home management during childhood morbidity was inversely associated with health care seeking as those who reported to have undertaken home management were less likely to seek health care for their ill child compared to their counterparts who did not *(AOR =0.38; 95% CI 0.28 – 0.50; P < 0.001*).

With regard to whether there was a temporal change to health care seeking over the study period, results indicate that there was a statistically significant difference in care seeking between t0 and t1 in that care givers were more likely to seek care from a health provider in t1 (April – June) compared to t0 (January-March) (*AOR =1.42; 95% CI 1.04 – 1.95; P < 0.05*).

Other factors included in the final model for care seeking predictors such as distance to health facility, receipt of education on danger signs and autonomy of care givers were not statistically significant.

5.3.16.2 Factors associated with timely care seeking in longitudinal analysis

Results of the final generalised linear mixed regression model for factors associated with timely care seeking are presented in table 5.11 above. Four factors namely: slum residence;

knowledge of child danger signs; home management of childhood illness and data collection point were significantly associated with timely care seeking from a biomedical health provider.

The results indicate that compared to care givers from Senti, those from Ntandire are less likely to seek health care for their ill child in a timely manner (*AOR = 0.54; 95% CI: 0.34 – 0.86; P<0.05)* whereas there was no statistically significant difference between Senti and Mgona care givers. There was a highly statistically significant difference between care givers who reported to have undertaken home management of their children's illness compared to those who did not, in that those who undertook home management were less likely to seek health care timely (*AOR = 0.36; 95% CI: 0.25 – 0.50; P<0.001).*

Being knowledgeable about child danger signs was significantly and negatively associated with timely care seeking as the results indicate that care givers with good knowledge of child danger signs were less likely to seek care in a timely manner relative to their counterparts with poor knowledge of child danger signs (*AOR = 0.52; 95% CI: 0.35 – 0.76; P<0.001).*

As indicated in preceding sections, determining whether there was a temporal change in timely care seeking from a biomedical health provider was of particular interest to this study as per longitudinal design. Results indicate a very strong statistically significant difference in timeliness in care seeking from a health provider between t2 (second follow up: i.e. April to June) compared to t0 (baseline: i.e. January to March). The results suggest that care givers were more likely to report seeking care in a timely manner during t2 by comparison to t0 (*AOR = 2.23; 95% CI: 1.42 – 3.48; P<0.001)* whereas there was no statistically significant difference in timely care seeking between t0 and t1.

Age of the child and perceived severity of childhood illness are two factors that were close to statistical significance *(P = 0.09*) in the final model. The findings though not statistically significant in the final model suggest greater likelihood of timely care seeking for younger children and likelihood of late care seeking for severe childhood illness symptoms.

In exploratory regression models, distance to health facility was statistically significant suggesting timely care seeking for care givers in proximity to a health facility (<30 minutes' walk was reference*) (P < 0.003)* relative to those farther away (> 60 minutes). However

statistical significance was lost in the final model. Education level of the care giver and household wealth were not statistically significant predictors of timely care seeking for child health services.

5.3.16.3 Factors associated with knowledge of child danger signs in longitudinal analysis

As per approach described in section 5.2.6.2, generalised linear mixed regression models were conducted to determine factors associated with knowledge of child danger signs. Results of the final model are also presented in table 5.11. Slum residence; care giver's autonomy, social capital; and severity of childhood illness are the four factors associated with knowledge of child danger signs.

Care givers from Ntandire were less likely to be knowledgeable about child danger signs by comparison with those from Senti *(AOR =0.50; 95% CI 0.28 – 0.89; P < 0.05)* whereas the difference between care givers from Senti and Mgona was statistically insignificant. Furthermore, care giver's autonomy had the largest impact on knowledge of child danger signs as care givers with a high autonomy score were approximately six times more likely to have good knowledge of child danger signs *(AOR = 5.7; 95% CI 3.49 – 9.45; P < 0.001)* relative to their counterparts with low autonomy score.

Likewise, care givers with a high social capital score were twice as likely to have good knowledge of child danger signs compared to those with low social capital score *(AOR = 2.44; 95% CI 1.53 – 3.88; P < 0.001)*. Similarly, compared to care givers who reported a perceived severity of their children's illnesses as minor, care givers who perceived their children's illnesses as moderately severe were more likely to be knowledgeable about child danger signs *(AOR = 1.86; 95% CI 1.16 – 2.98; P < 0.01)*. On the other hand there was no statistically significant difference in knowledge of child danger signs between care givers who perceived their children's illness as severe and those who perceived them as minor.

Birth order of the index child was significant in exploratory models and suggested that knowledge of child danger signs increased with an increasing birth order of the index child (the study child). Precisely this suggests that care givers whose index child was of a higher birth order were more likely to be knowledgeable about child danger signs compared to those whose index child was of a lower birth order. Nevertheless, in the final model birth order of index child lost statistical albeit being close to statistical significance *(P = 0.08)*. In the same

way, education level of care giver was almost statistically significant in the final model in the positive direction suggesting likelihood of better knowledge of child danger signs among care givers who had attained senior primary education compared to those with no education or junior primary (*P = 0.06).*

Results also indicate that there was no temporal effect on knowledge of child danger signs across the follow up time of this longitudinal study. Similarly, education level of the head of the household; age of the child, having received some health education on danger signs did not attain statistical significance in predicting knowledge of child danger signs.

Furthermore, frequency of contact with a health facility/provider did not have an effect on knowledge of danger signs as no statistically significant difference was noted between care givers who did not have contact with a health facility (no care seeking) and those who had sought care once, twice or thrice over the study period.

An additional analysis was undertaken in which a generalised linear mixed regression model was conducted to determine if frequency of care giver's contact with a health facility over the time of the study had a significant effect on knowledge of child danger signs. This model used t2 data on knowledge of child danger signs as the dependent variable, considering that t2 represented the last point of follow up hence any gain in knowledge of child danger signs over the period of care giver-health provider interactions could have been exhibited at this stage. This approach too, did not yield any statistical significance to suggest that more frequent contact with a health facility predicted knowledge of child danger signs (*P* values of 0.45; 0.74 and 0.96 for respective levels of the time-based care seeking variable).

5.3.17 Summary of longitudinal findings

The following salient points have emerged from longitudinal results:

A total of 427 care givers provided data in all three data collection time points of the study and 116 were lost to follow up at any one or both of the follow up data collection points. However a comparison of socio-demographic characteristics between care givers retained and lost to follow up in the study showed that there was no systematic loss to follow up in all but slum residence. However, no systematic

follow up was noted in Senti, where study participants were significantly lost to follow up.

While there was a statistically significant difference in prevalence of fever and diarrhoea morbidity over the three data collection time points, the subtle differences in proportions for overall childhood morbidity and ARI morbidity was statistically insignificant.

There was a statistically significant difference in care seeking from a health provider in the event of childhood illnesses over study time especially between t0 and t1 with a likelihood of better care seeking in t1 compared to t0 while no statistically significant temporal change was noted for t2 compared to t0.

Seven independent variables significantly predicted care seeking in a generalised linear mixed regression model. Education of care giver; more severe childhood illness; having fever symptoms; and first follow up data period were positively associated with care seeking from a biomedical health provider. Slum residence in Ntandire; older age of the child; and provision of home management for childhood illness, were negatively associated with care seeking from a biomedical health provider.

Four factors significantly predicted timely care seeking from a health provider. In particular, a temporal change was noted in timely care seeking and indicated that t2 period was positively associated with timely care seeking. On the other hand, slum residence in Ntandire; good knowledge of child danger signs; and provision of home management for childhood illness were negatively associated with timely care seeking from a biomedical health provider.

High autonomy of care givers, high care givers' social capital; and where childhood illness was perceived as moderately severe had positive association with knowledge of child danger signs. Slum residence in Ntandire was negatively associated with good knowledge of child danger signs. Knowledge of child danger signs over the three time points showed small proportional differences that were statistically insignificant suggesting no time effect on care givers knowledge of child danger signs.

5.4 Discussion of findings

This section discusses findings of the longitudinal study. Subsequent sections will discuss the following aspects of the study: childhood morbidity patterns; responses to childhood morbidity (i.e. home management of childhood illnesses, health care seeking from a health provider, and timeliness in care seeking); and knowledge of child danger signs.

5.4.1 Childhood morbidity patterns

A significant proportion of children were reported to have had illness episodes over the different times of the study duration. For example baseline findings found that 85% of care givers reported childhood morbidity. Morbidity results in two subsequent follow ups found childhood illness prevalence of 85% and 82% during t1 and t2 respectively. The childhood morbidity pattern as noted in this study therefore indicates a high burden of childhood diseases in the urban slum settings.

It is difficult to compare the morbidity results in this study with those reported in nationally representative surveys such as the Demographic and Health Surveys in Malawi and other studies due to differences in time references in capturing childhood morbidity data. This study captured morbidity data in the preceding three months whereas the national surveys capture the same data typically two weeks before the survey date. Nonetheless, childhood morbidity prevalence of up to 85% within a three months period and an average of 84% over three data collection points in a year, indicate a significant burden of childhood diseases. This is consistent with health facility data and subsequent comparisons made in Lilongwe. In particular, facility based data within Lilongwe city indicated a greater burden of malaria among under-five year old children who accounted for 51% of all cases of Malaria in 2008. Similarly informal settlements exhibited greater disease burden by comparison with other urban settings (GOM, 2010, UN-HABITAT, 2011).

This study found that fever was the most prevalent childhood illness symptom throughout the study duration with respiratory symptoms being the second most prevalent in t0 and t1 and diarrhoea being the second most prevalent in t2 and third in t0 and t1 (see table 6.9). This distribution of childhood illness prevalence is consistent with findings from DHS where fever has been the most prevalent in all surveys (NSO and IFC Macro, 1992, NSO and IFC Macro, 2000, NSO and IFC Macro, 2004, NSO and IFC Macro, 2010). The consistently high

prevalence of fever was expected. Malawi is a malaria endemic country and the number one cause of fever in sub-Sahara Africa (Chibwana et al., 2009). While it is acknowledged that fever may have been due to other childhood conditions, it is probable that malaria was the most significant contributor.

However, with the exception of the 2010 Malawi Demographic and Health Survey, all the preceding DHS (1992, 2000, and 2004) including the Multiple Indicator Cluster Survey (MICS) (2006) found diarrhoea to be more prevalent than respiratory symptoms even in urban areas. Two possible explanations may be put forward for this difference. Firstly, it is possible that there is a stronger predisposition to respiratory infections than diarrhoea within the slum settings. Some studies conducted in slum settings have similarly found that diarrhoea and respiratory infections contribute a significant burden of childhood morbidity but with respiratory infections exhibiting a higher prevalence than diarrhoea (Awasthi and Agarwal, 2003, Taffa et al., 2005).

The second reason pertains to time period of data collection. This study collected data over a period of about a year and hence captured any time variations of childhood morbidity which would collectively indicate prevalence differences between two illness symptoms. Cross sectional surveys such as DHS on the other hand capture data over a single point in time and over a short period of recall (2 weeks) hence would not be as responsive to temporal changes in prevalence. Indeed, the months of data collection for the DHS surveys (August to December) that indicate diarrhoea to be more prevalent than ARI symptoms largely correspond to the months of data collection for t2 (October to December) of this study which also indicate diarrhoea to be more prevalent than ARI symptoms.

As per its longitudinal design, denoting temporal changes in childhood morbidity was of particular relevance for this study. As the results indicate, there was no statistically significant difference in overall childhood morbidity (illness from any symptoms of interest) over the duration of the study. However there were statistically significant differences for fever and diarrhoea childhood morbidities over time.

For fever, a significant declining trend was noted with baseline results for which data was collected in the months of January to March registering the highest prevalence (77%) and slightly declining to 75% in t1 (April to mid-June) and 67% in t2 (October to December).

Cognisant that in malaria endemic countries like Malawi, the majority of fevers are due to malaria (Chibwana et al., 2009), this finding is consistent with expectations and confirms the seasonal variations of fever due to malaria (Ewing et al., 2010). To illustrate, both baseline and first follow up data collection times captured data that was predominantly within the rainy season in Malawi (December to April) which are high risk for malaria especially among under-five children. During this season, there is a proliferation of stagnant water points; grasses and some bush grow, creating a conducive environment for breeding of malaria causing mosquitoes. Moreover all study areas have a river running in their territorial boundaries and many houses are close to swampy areas. In addition, in community walk through during census and data collection, poor drainage systems were evident in all areas, particularly in Mgona.

The temporal change in diarrhoea morbidity while expected, is counterintuitive with regard to its direction. The results of this study indicate a highest prevalence (43%) in t2 (data collected in months of October to early December) and the lowest (27%) at t1, with baseline results indicating a 39% diarrhoea prevalence. There is a greater risk of diarrhoea in the rainy season (predominantly captured by t0 and t1) due to increasing number of flies, waste movement with rain water especially in context of poor refuse disposal as is the case in slums under study and other similar settings, and abundance of fruits which are sometimes consumed without proper washing. More specifically, there were reports of many pit latrines falling down during the rainy season, especially in Mgona hence a greater risk of childhood diarrhoea due to inadequate sanitation and heightened risk of environmental contamination. Precisely, for the aforementioned reason, the expectation was that diarrhoea would have been more prevalent in t0 and t1. While the study noted this temporal variation, no specific environmental context was established to attribute this situation.

Similar to overall morbidity, there was no statistically significant difference in prevalence of ARI symptoms over the duration of the study. The possible explanation for this is that risk factors for ARI in slum settings may be ever present and not particularly amenable to seasonal changes. Indeed, overcrowding, poor ventilated houses, smoke exposure, air pollutants are recognised risk factors of ARI (Dherani et al., 2008). These are prominent features of urban slum settings and were evident in all the three areas. These factors were unlikely to change

within the study duration, let alone vary by seasons for which the study time could have captured.

5.4.2 Responses to childhood morbidity

In this study, response to childhood morbidity was classified in three ways namely: home management of childhood illness; care seeking from a biomedical health provider; and timeliness in care seeking. The subsequent sections discuss these three.

5.4.2.1 Home management of childhood illnesses

Initial response to childhood illnesses at home represents one of the key elements of child care in the event of an illness. This study found that of care givers who had reported childhood morbidity, 54% at t0 (January to March), 64% at t1 (April to June) and 44% at t2 (October to December), undertook home management. A study conducted among the urban poor in south-western Nigeria found a higher proportion, as 75% of care givers conducted home management for their children with ARI symptoms (Ukwaja et al., 2012).

The temporal differences in proportion of home management in this study were statistically significant. It is unclear from this study why care givers exhibited differential home management decisions over the period of follow up. However, it makes intuitive sense that the period during which home management was the lowest also registers the highest for timely care seeking (refer to table 5.9) as it entails care givers rushed to a health facility rather than wait to undertake home management. The fact that home management had a negative significant effect on timely care seeking also corroborates this. Specific results of how respective childhood symptoms were managed were explored in qualitative inquiry and its results are presented later in this thesis (see chapter 6).

Local shops were the commonest source of medicines for home management of childhood illness. Other sources included left over medicines from a previous hospital visits and sourcing from friends or relatives. This finding is consistent with other studies on responses to childhood morbidities in Malawi and elsewhere denoting the significance of drug vendors or local shops in home treatment of childhood illnesses (Ewing et al., 2011, Rutebemberwa et al., 2010, Ukwaja et al., 2012). While initial childhood treatment/interventions at home is recommended by IMCI, especially in mild cases or as a way of reducing symptom progression, there are risks with some elements of home management of childhood illnesses. For example,

inappropriate use of antibiotics, improper dosages, poor storage of drugs in local shops, possibility of using expired drugs from shops or left over drugs are among the factors that potentially pose risk to sick children managed at home.

In essence some of these factors are exemplified in qualitative inquiry part of this PhD research. It was however beyond the scope of this PhD research to undertake assessments in aspects such as storage, quality and types of medicines available in local shops of slum settings. Nevertheless, quality assessments of medicines and food items by the Malawi Bureau of Standards and the Pharmacy, Medicines and Poisons Board is very infrequent and improbable in urban slum settings, rendering unearthing of such weaknesses problematic. It is therefore imperative that community and facility based health education programmes targeting care givers, should intensify and emphasise on aspects such as: consideration of expiry dates, purchasing of only over the counter drugs from local shops, and completion of dosages in order to prevent left overs for subsequent use and the risk of drug resistance. Training of shop owners on basic use of over the counter drugs has also been proposed in other settings (Rutebemberwa et al., 2010, Ukwaja et al, 2012) as it provides opportunity to provide health education to care givers at the point of purchase medicines.

5.4.2.2 Care seeking from a biomedical health provider

Distribution of care seeking from a health provider

In this study, a small majority of care givers sought health care from a biomedical health provider during baseline, first and second follow up times (61%, 65% and 58% respectively). Care seeking from this study compares favourably with those reported in DHS and other studies in urban slum settings. A study in Kolkata slums of India found care seeking of about 73% for childhood diarrhoea (Sur et al., 2004) and another study in Nairobi slums found that 60% of care givers sought care for their sick children (Taffa and Chepngeno, 2005). Admittedly, while care seeking in this study is generally not that low, there is still need to promote uptake of childhood interventions if their optimal benefits are to be realised.

Public health facilities represent the commonest source of health care services for under-five children in the slum settings under study. In view of poverty levels in the slum settings, provision of free services at the point of use in public health facilities best explains the common use of public health facilities. As previously shown in various studies, cost of health

care is a deterrent of health service use (Baume, et al., 2000, Breiman, et al., 2011, Hildenwall et al., 2007, Palmer et al., 2004). Besides, the geographical presence (availability) of public relative to private health facilities may also be a critical factor.

In Kenya, Taffa and Chepngeno (2005) found similar findings of significant utilisation of public health facilities albeit they questioned the quality of child health services in urban slum settings, and by extension, their capability to have a significant impact on reducing childhood morbidity and mortality. Likewise, the majority of care givers in this study did not rate the quality of under-five health services favourably as approximately 63% gave a rating of either fair, bad or very bad. Moreover as it will be further explored in qualitative findings of this PhD research, care givers expressed serious concerns with the quality of health care services for their children especially in public health facilities.

Determinants of care seeking from a biomedical health provider

The Andersen health utilisation model provided a tool for various determinants of health care seeking of under-five child health services, which fall within its predisposing, enabling and need factors and other components of the model. A more specific application of the Andersen model is presented in chapter 8 that integrates findings from different study designs of this PhD research. This longitudinal study found various factors that significantly influenced care seeking from a biomedical health provider, both from baseline and longitudinal analyses. Subsequent sections will discuss these determinants of care seeking. All references to statistical results in subsequent sections refer to longitudinal analysis unless specified otherwise.

This study found that older children were less likely to be taken to a health facility than younger children in the event of morbidity (AOR = 0.53; 95% CI: 0.35 – 0.80; $P < 0.01$). In particular this was more prominent and significant among children aged 37 to 53 months by comparison with children aged less than 12 months. This finding is consistent with other studies which noted greater likelihood of seeking health care for younger children than older ones (Ewing et al., 2011, Manna et al., 2013, Taffa and Chepngeno, 2005). Possible explanation for this relate to level of child dependence on the care giver and subsequent closeness of observation. Younger children are more dependent on the care giver hence care givers are more likely to observe and respond to childhood morbidity. Moreover, care givers

are probably aware that disease progression is faster among younger children than older ones hence more likely to respond with care seeking for younger children. Precisely, the experience of caring for a particular child may change as the child grows hence affect various dimensions of child care including health care seeking as the child grows.

Slum residence was also noted as a significant predictor in baseline results and across the entire longitudinal period. Whereas baseline results indicated that compared to Senti, Ntandire care givers were less likely to seek health care for their children, longitudinal results indicated that both Mgona and Ntandire care givers were less likely to seek care from a health provider relative to those from Senti. The difference in findings could be related to the number of observations as longitudinal data provided multiple observations across different times. Indeed in the longitudinal analysis for care seeking generalised linear mixed regression final model, there were 1145 observations compared to 461 for baseline multivariate regression analysis.

As demonstrated in this study, the three slum areas are fairly homogeneous in various characteristics thus this difference is not explicitly evident from this study. The only significant difference in slum characteristics noted in this study is distance to health facility where Ntandire is the farthest. Nonetheless, distance to health facility was not found to be a significant predictor of care seeking for under-five child health services. Moreover, Mgona is relatively closer to a health facility than Senti (refer to table 5.2) and yet care givers from Mgona are less likely to seek health care compared to those from Senti (AOR = 0.62; 95% CI: 0.41 – 95; $P < 0.05$).

Two possible attributable factors may be put forward to explain the differences in care seeking by slum residence. Firstly, of the three areas, the extent/prevalence of slum conditions (particularly overcrowding, sanitation, and types of housing) is arguably least in Senti. The interaction of multiple conditions that are characteristic of slum conditions might therefore influence care seeking for childhood illnesses in ways not observed by this study. Secondly, it is also possible that there are differential factors not directly assessed in great magnitude by this study, such as the working ethics of community health workers and volunteers which may have influence on health care seeking practices. For example, during qualitative inquiry a Health Surveillance Assistant from Senti mentioned that at some point,

she had involved the police to promote uptake of measles immunisation when some care givers were refusing to have their children immunised due to religious beliefs. It was reported that on the precedence of promoting the right to health for the children, the Malawi Police had intervened and this had a community level effect that subsequently led to an increase in utilisation of immunisation services. Such seemingly small interventions may have community wide effects for general child health services.

Education level of care givers positively influenced care seeking as care givers who had attained secondary or higher education were more likely to seek care for their children than those with no education or junior primary education. This renders support to other previous studies that noted that education is associated with care seeking (Fosu, 1994, Ogunlesi and Olanrewaju, 2010, Sreeramareddy et al., 2006,). This notwithstanding, other studies did not find a significant association between education of care givers and health care seeking for under-five children (Diaz et al., 2013, Getahun et al., 2010, Taffa and Chepngeno, 2005). The causal pathways of education of care giver and care seeking for under-five child health services have been extensively discussed, mostly relating to the capability of more educated mothers to be autonomous, have financial means to seek health care, and effectively relate with health workers to navigate through the health system (Adetunji, 1995).

Care givers who reported to have undertaken home management of childhood illness were less likely to seek health care than those who did not, and this was noted in both baseline only and longitudinal results. This finding is logical in the sense that in some cases home treatment may have led to childhood symptoms subsiding, effectively eliminating the need for care seeking from a health provider. This notwithstanding, a high proportion of care givers who undertook home management still sought care (55%, 58% and 45% at t0, t1 and t2 respectively). This may suggest that in some cases, home management was being undertaken for children whose severity of illness warranted health facility based care in the first place, or that in the majority of cases, home management was not very effective. It follows therefore that in the context of promoting home management as an acceptable response measure to childhood morbidity, care givers should be equipped with the requisite knowledge to recognise what aspects of childhood illness can be managed at home and how they can be effectively managed. Failure to do this may lead to another problem of late care seeking as some results in this study attest. Implementation of IMCI in Malawi provides for education of

care givers on home management of childhood illness. Quantitative evidence remains sparse regarding whether care givers provide appropriate home management to their sick under-five children, or more importantly, to understand what factors facilitate or deter effective home management of childhood illnesses.

Perceived severity of childhood illness was found to be associated with care seeking. In baseline results, childhood illness episodes perceived as severe were about two and half times more likely to seek health care from a biomedical health provider than those perceived as minor (AOR 2.46; 95% CI: 1.38 – 4.38; $P < 0.01$) while there was no statistically significant difference between moderate and minor illnesses. In the entire longitudinal data, however, childhood illnesses classified as moderate (AOR 1.58; 95% CI: 1.13 – 2.21; $P < 0.01$) and severe (AOR 2.91; 95% CI: 1.96 – 4.29; $P < 0.001$) were more likely than minor illness for health care seeking. This renders support to similar findings suggesting greater likelihood of care seeking with more severe childhood symptoms in studies conducted in Malawi (Chibwana et al., 2009, Ewing et al., 2011), Kenya (Taffa and Chepngeno, 2005), Ethiopia (Getahun et al., 2010) and Uganda (Rutebemberwa et al., 2010). This intuitively makes sense considering that as childhood condition progresses in severity, it stretches beyond the scope that care givers may attempt home treatment hence seeking outside help.

This study relied on assessment of mothers to denote severity of childhood illness, reflecting perceived need as opposed to evaluated need as per Andersen's health utilisation framework (refer to section 4.4). While this represented a practical approach to assessing this variable, its use has been contested owing to reliance on care givers to undertake an implicit severity rating, which may require technical expertise especially if measurements are to be standard and easily comparable (Taffa and Chepngeno, 2005). Cognisant of the merits of this argument, it is still noteworthy that decisions to seek care are undertaken by the same care givers and hence their very perception of illness severity probably provide good indications of decision making dynamics. Precisely, in spite of these methodological challenges, such measure still provide crucial information in decision making considerations. Not surprisingly, severity of childhood illnesses as perceived by care givers has been used in previous studies (Chuma et al., 2010, Ewing et al., 2011, Sur et al., 2013, Taffa and Chepngeno, 2005).

Another childhood illness factor that emerged as a significant predictor of care seeking in this study was having a fever episode. Compared to other childhood morbidity where fever did not exhibit, having fever was significantly associated with care seeking in both baseline and longitudinal analysis. This may be related to the fact that fever was most prevalent and is mostly related to malaria with which care givers have experience and they recognised that if untreated, childhood condition progresses quickly. These findings are in contrast with those from a study in the urban slums of Kolkata in India where having fever was not a significant factor in health care seeking for under-five children (Sur et al., 2013). It is however consistent with other study findings suggesting that having fever predicted care seeking in under-five children in Nairobi slums (Taffa and Chepngeno, 2005) and rural Uganda (Rutebemberwa et al., 2010).

Diarrhoea and ARI morbidity were not associated with care seeking from a health provider. This is in contrast with findings from a study in the slums of Nairobi, which found that care givers were more likely to seek health care for diarrhoea symptoms than coughing (Taffa and Chepngeno, 2005). With regard to diarrhoea, it is probable that some aspects related to beliefs pertaining to aetiology of diarrhoea may affect care seeking decisions. For example, the commonly held belief in the study setting that teething leads to diarrhoea would potentially result in believing that diarrhoea is self-limiting under such circumstances. Moreover, wide access of oral rehydration salts may have significant influence of preventing care seeking from a health provider. Oral Rehydration Salts (ORS) are widely available and actively marketed in Malawi to the extent that 96% of care givers know about ORS as an intervention for diarrhoea (NSO and IFC Macro, 2010). The use of ORS is also generally regarded among care givers as treatment for any form of diarrhoea. In this case, home treatment with ORS was probably perceived to be sufficient, and in the process the likelihood of care seeking outside home is significantly reduced.

It is surprising that ARI symptoms were not significantly associated with health care seeking. Similar result albeit for coughing symptoms were found in a study in the Nairobi slums in Kenya. Rationalising this finding, the authors posited that the fact that respiratory infections were so common in urban slum setting of their study, care givers may have thought illness with respiratory infection symptoms were like any other experienced many times before hence did not bother seeking outside help (Taffa and Chepngeno, 2005). In this study

however, since ARI symptoms are characterised by coughing and fast breathing, the expectation was that this combination would have been considered serious enough to warrant care seeking from a health provider. The possible explanation could be that care givers lack knowledge of the seriousness of ARI symptoms and by extension, the need for prompt antibiotic treatment available from a health facility. Indeed, even though pneumonia is one of the commonest causes of childhood morbidity and mortality, care seeking has been low in the past years and recent estimates of 70% care seeking for pneumonia could be better (GOM, 2013b). Children with ARI symptoms require prompt antibiotic treatment (NSO and IFC Macro, 2011, WHO and UNICEF, 2013). Specific health education programmes to increase knowledge on the dangers of ARI and consequently the need for prompt care seeking is therefore warranted in urban slum settings.

Denoting temporal changes in care seeking for under-five child health services was of particular interest for this longitudinal study. The findings indicate that there was a statistically significant difference in care seeking between baseline (collected in January to early March) and first follow up (data collected late April to mid-June) (AOR = 1.42; 95% CI: 1.42 – 3.48; P <0.05) in that care givers were more likely to report seeking care at t1 compared to t0. There were no directly observable factors to attribute this temporal variation in this study. Nonetheless, two possible reasons could be responsible.

The first relates to seasonal variations with regard to the opportunity cost of health care seeking. One of the salient distinctive features for the months during which the three phases of data were collected is that baseline and first follow up predominantly include the rainy season which is typically from December to late April. In relation to this study, the rainy season was at the peak during baseline and very early stages of first follow up data collection. Most farm activities would be happening around the months covered by baseline and by the time of t1, much of the farm activities have been undertaken and it is a period awaiting crop maturity. While most residents in slum settings do not own land or farm fields, the majority of care givers in the slum settings are involved in casual labour which during the rainy season predominantly include piece works for cash in farms elsewhere. Besides, many other cash for work programmes by the government are undertaken during this time. Considering the availability of multiple income generating activities during this period, it is probable that the opportunity cost of seeking health care was perceived to be higher during the period covered

by baseline than that of first follow up. Consequently health care was more likely to be sought during t1 in comparison with t2.

The second reason pertains to mobility from a health facility to households. The commonest means of mobility to a health facility among care givers in slum settings is walking. Granted that months covered by the baseline data collection are at the peak of the rainy season, weather (too much or persistent rains) would potentially deter walking to health facilities in the event of childhood illness. This hindrance is significantly reduced as the rains subside.

Care givers knowledge of danger signs was not a significant predictor of health care seeking of under-five child health services in this study. This contrasts with a commonly held position that symptom recognition is a critical predictor of care seeking for child health services (Janicke et al., 2001, Rutebemberwa et al., 2009). Indeed promotion of health education on child danger signs to care givers within the Community-IMCI strategy is on the premise that knowledge of child danger signs will promote uptake of child health services. However, other research findings have equally been divergent in this regard (Herman et al., 1994, Hill et al., 2003) and seemingly render support to the lack of significant association noted in this study. For example in a study conducted in Egypt, mothers were provided with brief descriptions of childhood illnesses and asked how they would respond in each case. Results from this were compared with their responses to repeated subsequent episodes of ARI. In spite of mothers generally recognising child danger signs, their knowledge did not lead to taking appropriate action of seeking health care outside the home (Herman et al, 1994, Taffa and Chepngeno, 2005).

5.4.2.3 Timely care seeking from a biomedical health provider

Description and distribution of timely care seeking

Discourse in appropriate care seeking transcends mere seeking of care from a biomedical health provider, as it also entails seeking care for the sick child timely. Late care seeking has been shown to contribute to mortality in under-five children in various childhood morbidities in child death social autopsies and similar study designs. For example, late care seeking significantly contributed to under-five child mortality from ARI in Uganda (Källander et al., 2008), for malaria in Tanzania (Armstrong-Schellenberg et al., 2003) and for various childhood

morbidities in Ethiopia (Fantahun et al., 2007). Improvements in timely care seeking therefore remain integral to child health programming in urban slums and other settings.

As previously alluded to, in this study, timely care seeking was defined as seeking health care within two days of onset of child illness symptoms. The basis for two days being the commitment that heads of states made at the Roll Back Malaria (RBM) summit of 2000 in Abuja that those suffering from malaria should have access to appropriate, affordable and correct treatment within 24 hours of symptom onset (Rutebemberwa et al., 2010). For the same reason that prompt access to effective health care is essential not only for malaria, this definition was applied to all child illness symptoms of interest in this study.

However, considering that study participants typically had low education levels and that people in study areas hardly use watches to check time, it was felt that eliciting time information could be problematic using hour estimations. Thus, similar to Rutebemberwa et al. (2010), days were used to approximate the 24 hour period and this approach was regarded to be more practical and contextually relevant. In this case, care givers who reported care seeking the same day or by the next day (after a night) of symptom onset were classified to have sought care within 24 hours (by approximation) hence timely. Those who reported to have waited for another day (beyond next day) were considered to have sought care late (beyond the 24 hour period). Consequently, using days in collecting this information meant that within two days (same day or by next day) was more representative of the 'within 24 hours' period albeit acknowledging that in some cases this was an overestimation. Our experience in this study renders support to a call for more reliable methods of retrospective time estimation in surveys conducted in developing country contexts, especially among participants of low literacy.

During baseline, 53% of care givers sought health care timely. The proportion almost remained the same during t1 as 54% sought care timely but greatly increased to 74% by t2. This compares favourably with results of some studies conducted in the African region which found timely care seeking for childhood illness to be 45% in Uganda (Rutebemberwa et al., 2010), 11% in Ghana (Ahorlu et al., 2006) and 16.5% in Nigeria (Ukwaja et al., 2012). All these studies also used the 24 hours period as the cut-off point distinguishing prompt and late care seeking.

Determinants of timely care seeking

In this study, four factors significantly predicted timely care seeking namely: slum residence, care givers knowledge of child danger signs, home management of childhood illness, and data collection time point. Birth order of the study index child and parity of the mother were significantly associated with timeliness in care seeking in baseline results but not in longitudinal analysis, even though birth order of the index child was significant in exploratory regression models and lost significance in the final model.

Similar to results of health care seeking, care givers in Ntandire were less likely to seek care timely by comparison with care givers from Senti (AOR = 0.54; 95% CI: 0.34 – 0.86; $P < 0.05$). Although there was a statistically significant difference in health care seeking between Mgona and Senti care givers, there was no statistical significance in the difference between the two slum settings with regard to timely care seeking. However, Mgona care givers proportionately sought care timely compared to those from Senti during all study points of data collection (t0 to t2).

The late care seeking among Ntandire care givers relative to their counterparts from Senti may be related to distance they have to travel to a health facility. As demonstrated earlier (table 5.2) the majority of care givers from Ntandire reside an hour or more walking time to a public health facility which they frequently utilise. Conversely, those from Senti and Mgona mostly travel in under 30 minutes or slightly more. Even though distance to health facility was not significantly associated with timely care seeking in the final models, it demonstrated statistical significance in exploratory regression models suggesting that care givers closer to health facilities were more likely to seek care in a timely manner. The distance effect may therefore represent a plausible explanation for the significant differences in timely care seeking by slum residence.

This study also found that care givers who had undertaken home management were less likely to seek care in a timely manner compared to those who did not (AOR = 0.36; 95% CI 0.25 – 0.50; $P < 0.001$). Intuitively, this makes sense considering that care givers who provide home management may wait on the effectiveness of the home interventions they have provided before they seek outside help from a biomedical health provider.

In light of the fact that home management of childhood illness was also negatively associated with care seeking, these findings have significant implications for child health policy and practice. In particular, it is important that while home management is promoted as useful with regard to treatment of minor childhood ailments and avoidance of complications especially in the context of health access barriers, careful consideration should be made so that it is not itself a hindrance to appropriate care seeking.

Studies assessing determinants of delay or timely care seeking for childhood illnesses, such as Amasiri de Silva et al. (2007), Chibwana et al. (2009), Taffa and Chepngeno, (2005) and Ukwaja et al. (2012) have not explicitly reported on the effect of home management hence comparison of this finding to other settings is limited. Nonetheless, contrary to this study's findings, home management with tepid sponging was predictive of prompt care seeking for children with febrile conditions while other home management interventions such as giving pain killers, herbal medicine, or other antimalarial drugs did not have any significant effect in a Ugandan study (Rutebemberwa et al., 2010).

Care givers with knowledge of child danger signs were less likely to seek care on time compared to their counterparts with no or very limited child danger signs knowledge. This appears counterintuitive. However a possible explanation elucidating this scenario may relate to the confidence in recognising potential life threatening situations. It is possible that due to their knowledge of child danger signs, care givers had confidence that they would recognise when the child absolutely needed outside help hence watchfully waited. On the other hand, their counterparts with no or limited knowledge tended to rush to the hospital as they were uncertain about the potential risks.

This study noted temporal changes in prevalence of timely care seeking as the findings suggest that care givers were twice as likely to seek care timely during t2 compared to t0. An increase from 53% at baseline to 74% of care givers having sought care timely at t2 is a big leap and may suggest implementation of a highly effective intervention. However, there was no specific intervention within the period in any of the study settings. The study could not explicitly determine any factor attributable to this change. This notwithstanding two possible explanations can be put forward albeit acknowledging their effects may not have had such a significant temporal change.

Firstly, data for t2 are typically the off-farm season months (August to November) hence there are few casual jobs which care givers would attend to. Consequently, there is more time for child care including rushing to the hospital in the event of any childhood illness. Secondly, considering that care givers had been followed up for about a year by the time of t2, it is possible that the reported timely care seeking is as a result of the Hawthorne effect. The Hawthorne effect relates to people's change in behaviour due to awareness that they are being observed hence embrace more socially desirable behaviour or expected good practice in respective situations (Bowling, 2009).

The distance effect on timely care seeking in exploratory regression models suggested that care givers residing farther from health facilities were less likely to seek care in a timely manner compared to their counterparts in proximity. However distance lost statistical significance in the final models in both baseline and longitudinal analysis. In. The findings are in contrast with those found in other studies in sub-Sahara Africa (Chuma et al., 2009, Getahun et al., 2010, Herbert et al., 2012) where proximity to health facility predicted prompt treatment seeking for febrile children. Thus the need to bring health services closer to the people as a strategy to increase uptake of health services as enshrined in various policy content for Malawi Ministry of Health (GOM, 2013, GOM, 2011, GOM, 2004) is not strongly supported for urban slum settings in this study.

5.4.3 Knowledge of child danger signs

Imparting knowledge of child danger signs has been an integral part of child health programming particularly emphasised in implementation of the community component of IMCI. This is on the premise that care givers recognition of child danger signs would trigger appropriate care seeking from a health facility (Manna et al., 2013).

As discussed under determinants of care seeking earlier, this study found that having knowledge of child danger signs was not predictive of care seeking from a health provider and was, in fact negatively associated with timely care seeking. This is consistent with findings from a study in Egypt that noted that care givers do not usually seek appropriate medical care even when they recognise that a child condition is life threatening (Herman et al., 1994).

The paradoxical evidence pertaining to knowledge of child danger signs and its effects on appropriate care seeking warrants further rigorous research methods such as longer term

longitudinal studies or Randomised Controlled Trials (RCT) to inform child health programming. This notwithstanding, it is probable that in practice, providing education to care givers to recognise child danger signs will remain integral to health programming that pursues increasing uptake of child health interventions. In essence, it makes logical sense to devise ways to ensure that care givers knowledge of danger signs should be transferred into appropriate action. However, it is imperative that a robust and context appropriate evidence base is generated to inform implementation of strategies relating to recognition of knowledge of child danger signs.

In this study, in addition to determining the effect of knowledge of child danger signs on responses to childhood illness (care seeking and timely care seeking), knowledge of child danger signs was used as a dependent variable. Some studies have used disease or condition specific child danger signs, such as danger signs for diarrhoea (Manna et al., 2013), danger signs for malaria (Chibwana et al., 2009) and acute respiratory infections (Ukwaja et al., 2012). Considering that the study focussed on three childhood symptoms namely, ARI symptoms, fever and diarrhoea, six child danger signs that generally result from these three symptoms of interest were used. The definition of the knowledge of child danger signs variable in this study has been provided earlier in section 5.2.6.1.

While studies have reported on care giver's knowledge of child danger signs, methodological difficulties in eliciting this information in a reliable and practical way have hardly been discussed. For instance, asking unprompted questions on danger signs as was the case in this study presents more or less an academic examination environment whose questions rely on memory of care givers who may not recall at the time of the survey but easily recognise danger signs when they occur in their child. Questions with prompted responses on the other hand may lead care givers to the responses hence they may easily respond as knowing them even when they did not. Such leading approaches may not be suitable to assess knowledge.

The complexity of both approaches is aggravated in developing countries where these danger signs have to be translated in the local language for elicitation from care givers usually with low education levels. Nonetheless, some innovative approaches have been utilised. For example, a study in Egypt, used video depicting children with respective danger signs and then asking care givers to describe them and indicate their potential response to these

childhood morbidity. Their responses were then compared with their actual care seeking. It was found that symptom recognition did not lead to appropriate care seeking (Herman et al., 1994). It follows that innovative approaches to solicit such data need to be continuously investigated.

In this study, a very small proportion of care givers had knowledge of danger signs as only 26%, 28% and 27% possessed good knowledge of child danger signs in t0, t1 and t2 respectively. Granted that the unprompted response data elicitation may have potentially underestimated these estimates relative to actual visualisation of danger signs description, it is still safe to state, judging by very low estimates that knowledge of child danger signs is insufficient. It is therefore imperative that efforts should be put in place to improve knowledge of child danger signs among care givers.

Determinants of knowledge of child danger signs

Four factors were found to have statistically significant effect on care givers' knowledge of child danger signs and they include: slum residence, autonomy of care giver, social capital of care giver, and perceived severity of childhood illness.

Care givers from Ntandire were less likely to be knowledgeable about child danger signs compared to those from Senti while there was no significant difference between Senti and Mgona care givers. It is probable that the difference in knowledge of child danger signs is due to a combination of factors such as limited exposure to education on danger signs; limited contact with health facility; level of education; and the social dynamics of the community. For example, of all the three settings, Ntandire is the largest both in terms of geographical size and population. At the time of this study there was only one HSA attached to Ntandire hence a significant workload that would lead to ineffective delivery of services such as education on danger signs or general child care within the community by comparison with other settings.

Compared to care givers with low social capital score, those with a high social capital were more than twice as likely to be knowledgeable about danger signs (AOR = 2.44; 95% CI 1.53 – 3.88; P <0.001). While this study did not find such an association with care seeking, the strong statistical significance in knowledge of danger signs endorses the relevance of care givers social capital in child health programming. The direction of this association appears logical considering that a high social capital entails greater social networks, ability to trust people

and active community engagement. In this way care givers with high social capital have opportunity for wider interactions with people within and outside the community, among which are channels of information sharing which may include aspects of child danger signs.

It has been posited that urban residents may have limited social capital as social cohesion may be lost by nature of urban living relative to rural areas (Cassell et al., 2006). This is applicable in Malawi too considering that rural life remains largely communal with greater social cohesion characterised by sharing of food items, taking a neighbour's sick child to the hospital in his/her absence, and in some cases ferrying water for the elderly and other disadvantaged people. This is rarely practised in urban slum settings hence social capital may relatively be better in rural areas. Nonetheless, social capital scores of care givers in this study are not that low with 56%, 58% and 62% classified as having high social capital scores in Senti, Mgona and Ntandire respectively. It is important that social capital is utilised to have effect on child health outcomes beyond knowledge of child danger signs. Ethnographic studies may provide crucial information into understanding social capital in slum settings and how it can be used to promote child health and survival.

Autonomy of care givers was significantly associated with knowledge of child danger signs with autonomous care givers about six times more likely to be knowledgeable about child danger signs than their counterparts with low autonomy (AOR = 5.74; 95% CI 3.49 – 9.45; P <0.001). Although we have not come across studies that have assessed the effect of autonomy specifically on child danger signs, its protective effect against child mortality have been documented (Fantahun et al., 2007). Thus while autonomy of care givers has not been found to be associated with care seeking in this study, its highly significant association with knowledge of child danger signs suggests its relevance and hence its consideration in child health programming.

Care givers who had perceived their children's illness to be moderate were more likely to be knowledgeable about danger signs than those who perceived them as minor. Considering that severity assessment of a child's condition was as per care givers' perception (what Andersen terms 'perceived need') as opposed to evaluated (objectively verified by health workers), the most probable conclusion from this would be that perception of moderate severity was likely more accurate than minor illness scoring.

Care givers who reported to have received some health education on child danger signs were proportionately more knowledgeable about child danger signs compared to care givers who had not received any education (39% versus 25% across the longitudinal time follow up). However this difference was not statistically significant. This finding is counterintuitive and has significant policy implications pertaining to delivery of health education on child danger signs. These implications arise from two probable reasons for this finding. Firstly, the mode of content delivery does not effectively allow for retention of knowledge among care givers which can subsequently be applied to child care practices. Examples may include hurried health education sessions especially in the context of long queues in health facility settings; too much information imparted at once rendering comprehension difficult especially with low education levels as is the case with care givers in slum settings. Secondly, health education on danger signs is so infrequent to allow retention of information as would have been the case with frequent and repeated sessions on the topic. This is possible in urban slum settings in Malawi where community health initiatives are sparse on the understanding that such areas being within urban boundaries have good access to health services.

The IMCI approach advocates using care givers contact with the health system as an opportunity to provide integrated care to the sick child and also to provide essential health information on effective care practices, among them being: danger signs; home management of childhood illness and appropriate care seeking. Consequently, it is a requirement that care givers should be educated on child danger signs and other similar child health care aspects upon discharge from a paediatric hospital, in under-five health clinics, during times of care seeking from a health facility and other forms of contact with the health system. This longitudinal study found that frequency of contact with a health facility did not have statistically significant effect on knowledge of child danger signs. Compared to care givers who reported not to have sought care for the entire study period those who had sought care once, twice, or thrice over the study period did not show any better knowledge of child danger signs. Moreover, those who had not sought care at all were proportionately better in terms of knowledge of child danger signs than those who had sought care thrice during the study period.

Obviously there are potentially multiple sources of information for several aspects of child health including danger signs. Radios, peers, community organisations, women's groups, and

routine under-five clinics are cases in point in slum settings. It was beyond the scope of this study to assess the combined effects of all these sources on child danger signs. Granted, it is logical to expect better knowledge of child danger signs among frequent users of the health system especially in the context of the requirement to use health system-care giver interactions to impart this knowledge.

The absence of such an expected association implies the following possibilities. Firstly, there is a policy-practice gap in that while the policy or strategic intention is to undertake health education on child danger signs, in practice this does not happen. Indeed, grave human resource challenges combined with long queues in under-five out-patient and in-patient departments, and lack of supervision of health workers to ensure policy and clinical standards adherence in the Malawi health system reflect challenges that would affect such service delivery. Secondly, even when such health education is undertaken, it is sometimes delivered using means that are not effective to allow knowledge retention among care givers.

5.4.4 Strengths and limitations of the longitudinal study design

Various strengths and limitations are acknowledged for this longitudinal study. This section highlights strengths, limitations and some considerations used in attempts to surmount study limitations.

5.4.4.1 Strengths of the longitudinal study design

The use of a longitudinal design represents one of the strengths of this study because it allowed for assessment of multiple episodes of childhood illness thereby providing more observations from the sample. Consequently, more observations are likely to provide more reliable estimates than would have been the case with a cross sectional design with single observation

In addition, the fact that the same care givers (cohort) were followed up for a period of 9 months to a year represents a strength of the design as the findings from different times of data collection during the study were more accurately comparable than is the case with a design that would have applied a follow up design using repeated cross sectional surveys hence using different study participants in the community.

Another strength is that the longitudinal design provided opportunity to assess temporal variations in dependent variables and what factors had an effect on respective variables. Thus while the time of follow up provided opportunity for multiple observations hence increase likelihood of reliable estimates, variations of various aspects of child health over time are important for evidence based child health planning in their own right.

Furthermore, sampling and participant recruitment for this longitudinal study design involved a rigorous process which arguably minimised respondent selection bias. As elucidated in section 5.2.4, undertaking community walk through in each of the study areas to conduct a census of all eligible participants, then randomly selecting them using computer generated numbers represents a rigorous method. On this basis, the study made significant steps to attain a sampling frame representative of characteristics of the population of interest.

The study focus on common childhood symptoms/conditions is another strength of the study as it contributes to potential solutions to child health problems for which a significant impact on improving child health and survival can be felt. Moreover, the study focus on urban slums is of particular strength. To the knowledge of the PhD researcher, there has been no study conducted on child health aspects of this study in urban slums in Malawi. In the context of increasing urbanisation and subsequent formation of slums in Malawi, this PhD research has effectively attempted to link two of the country's key public health and development challenges pertaining to the health and survival of children.

The good retention rate of participants in this study also represents its strength and reflects on good efforts in management of the study. Granted that urban slum populations are usually not static (also noted in this study), the low attrition rate in this study is commendable. Besides, the fact that attrition did not lead to selective non-response represents a strength of the study as the risk of attrition bias, a critical design challenge in longitudinal studies (Bowling, 2009) was significantly reduced. In the same vein, response rate was very high (98% - 100%) from baseline to second follow up.

5.4.4.2 Limitations of prospective cohort design and attempts to surmount them

This longitudinal study relied on participant's recall of childhood morbidity and their response to respective morbidities in the three months preceding the date of interview for baseline and typically three to four months in interval periods of follow up data collection. Considering

the long period required for recall, there was potential for recall bias. It is acknowledged that various studies have used a two weeks or in some cases one month recall periods. However, for purposes of attempting to get as many observations as possible within the study period and effectively not skip potential observations in the study period, it was necessary that the design captures the indicated period.

The second study limitation pertains to the risk of reporting bias that is characteristic of studies that rely on information as reported by study participants (Bowling, 2009). Moreover, the risk of respondents providing socially desirable responses may arguably be heightened in a study investigating health care seeking practices for child health service. For instance, it is probable that eliciting information pertaining to care seeking from a health facility (including whether care was sought timely), will result in respondents providing a response that they did seek care and in a timely manner, because it is socially expected to do so.

Cognisant of the risk of recall and reporting biases, the study employed a technique to reduce these limitations by verifying reported morbidities with information in child health passports. In the Malawi health system, access to public health services requires the use of health passports (booklets which contain brief health history of the holder and pages in which each subsequent illness and treatment records are written). For under-five children, the child health passport also includes a growth monitoring chart, immunisation records, and birth history. It is the MOH policy, currently adhered to reasonably well, that possession of a child health passport is a prerequisite to receipt of treatment especially at public health facilities. This system provided opportunity to verify participants' information (by checking in child health passports) hence reducing the potential recall and reporting biases.

This notwithstanding, three key challenges to implementation of this verification technique existed albeit in few cases. Firstly, it should be acknowledged that private health facilities do not seem to strongly enforce the use of health passports. Therefore, there was still a risk of bias resulting from inability to verify care givers reported information or indeed failure to recall events under investigation in this study, especially when care was sought from private health providers. However, the fact that the majority of care givers reported to use public health facilities minimised this risk. Secondly, there were instances when care givers reported that they were unable to locate child health passports hence the opportunity to verify was

not available. Thirdly the use of a health passport was limited to reducing recall and reporting biases potentially resulting from health related information such as childhood morbidity, care seeking, timeliness in care seeking to a certain extent, and immunisation status. Other information elicited such as social capital, autonomy, household wealth were still prone to reporting bias.

5.4.5 Conclusion

The longitudinal study design of this PhD research has found a significant burden of under-five child morbidity in the slum settings. Health care seeking practices while not very low, are not optimal if benefits of cost-effective child health interventions are to be attained. Timely care seeking is generally low despite a significant increase noted in t2. Likewise, knowledge of child danger signs is very low.

The findings have various implications for child health policy and practice in slum settings. It is imperative that a comprehensive community-IMCI should be implemented in order to: promote optimal uptake of appropriate care seeking for under-five child health services; promote recognition of child danger signs; address social determinants of health such as sanitation, education of care givers, social capital, and empowerment of women in decision making; and sustain data collection and use for decision making to inform evidence based planning. These are further elucidated in overarching recommendations for child health policy, practice and research in chapter 9.

CHAPTER 6

CHILD CARE PRACTICES AND HEALTH SYSTEM FACTORS INFLUENCING UTILISATION OF UNDER-FIVE HEALTH SERVICES: A QUALITATIVE INQUIRY

6.1 Introduction

The qualitative study design of this PhD research was undertaken to serve three cardinal functions. Firstly, it was designed to explore child care practices for under-five child health services among care givers in urban slums (objective 5). Secondly, to contribute to the following objectives: determine care givers response to childhood illnesses (objective 1); to determine factors that influence care seeking decisions (objective 2); and to determine treatment actions focussing on use of different health providers including barriers associated with access to under-five health services (objective 3). In addition, qualitative methods were used to explore health system attributes used in a Discrete Choice Experiment study to achieve objective 6 as will be explained in Chapter 7.

This chapter therefore presents the methodological considerations of the qualitative study, followed by results, discussion of findings, and strengths and limitations of the qualitative study design.

6.2 Methodology

6.2.1 Study design

The qualitative study design was used in this PhD research to provide explorations of the health care seeking practices and other child health promoting practices within an urban slum setting in Malawi. Qualitative studies have proven to be very useful in exploring phenomena in great depth and detail (Patton, 1990) consequently leading to a comprehensive understanding of the topic under study. In particular, qualitative studies allow the researcher to approach *'fieldwork without being constrained by predetermined categories of analysis thereby contributing to openness, depth and detail'* in the issues selected for study (Patton, 1990).

Moreover, qualitative studies are considered critical in informing various facets of quantitative studies such as questionnaire development and in providing exploratory

information due to their fluidity relative to quantitative methods (Bowling, 2009). In health services research, qualitative studies are known to provide invaluable complementary information to quantitative studies hence making findings more meaningful (O'Cathain et al., 2013).

6.2.2 Eligibility criteria

The inclusion criteria for participation in the FGDs entailed the following: residence in Senti; Mgona or Ntandire; experience of being a primary care giver of an under-five year old child (whether presently or previously) and provision of informed consent to participate. All participants meeting the eligibility criteria above participated in FGDs regardless of their participation (or lack of) in the longitudinal study that was ongoing for most part of the period this qualitative study was being undertaken.

Eligibility to participate in Key Informant Interviews (KII) entailed: current involvement in issues of child health (policy, district health management; health care service delivery at community or health facility level) or urban planning.

6.2.3 Sample size and sampling

Determination of sample size in qualitative inquiry is usually not straightforward as there are no explicit formulae as often applied in quantitative studies. As Patton (1990) argues, sample size in qualitative research depends, among other factors, on the purpose of the inquiry, the depth or breadth of what the researcher wants to know, and availability of resources. More aptly put:

"the validity, meaningfulness and insights generated from qualitative inquiry have more to do with information-richness of cases selected and the observational/analytical capabilities of the researcher than the sample size" Patton (1990; p 185).

This notwithstanding, literature in qualitative research has posited that the point of *redundancy* or *saturation* should determine sample size (Bowling, 2009, Patton, 1990). In this PhD research therefore, data saturation/redundancy, which is defined as the phenomenon in which additional sampling units are not yielding new information, (Bowling 2009, Patton, 1990), was used to guide the ultimate sample size for qualitative inquiry. Consequently, a total of 8 FGDs (2 in Senti, and 3 in Mgona and 3 in Ntandire) were conducted. Each FGD

involved 10 to 12 participants and collectively, 89 care givers participated in FGDs. A range of 6 to 12 participants is considered an optimal size for FGDs to achieve effective discussion (Bowling, 2009). A total of 10 participants were involved in KII hence the full qualitative sample constituted 99 participants. Table 6.1 below presents the qualitative sampling unit

Table 6.1: Sampling unit of qualitative research design

Sampling Unit	Number samples
Key Informant Interview (KII) Participants	
Health policy	1 (National Coordinator of one of the child health programmes)
City Council	1 (One of the coordinators of health at Lilongwe City Council)
District Health Office (District Management)	1 (One senior District Health Management Team member)
Health workers at facility level	3 (2 medical assistants and 1 nurse)
Health workers at community level	3 Health Surveillance Assistants (HSAs), one in each study area
UN-HABITAT	1
Focus Group Discussions	
Senti	2 (FGD 1: N = 10; FGD 2 N = 12)
Mgona	3 (FGD 1: N = 12; FGD 2 N = 11; FGD 3 N = 12)
Ntandire	3 (FGD 1 N = 12; FGD 2 N = 10; FGD 2 N = 10)

6.2.4 Sampling frame and recruitment procedure

Participants were selected using non probability sampling methods. In particular, participants in FGDs were selected using a convenient sampling technique. Convenient sampling involves the selection of most accessible eligible participants to the study (Bowling, 2009). The selection procedure therefore entailed going door to door and conveniently selecting eligible study participants who were available at the time of recruitment. However, an attempt was

made to select participants from different localities within a particular urban slum by spreading out the recruitment over a geographically wide area.

Ensuring some level of homogeneity in selection of FGD participants for this study was crucial to solicit rich information. As Bowling (2009) argues, without careful balance in FGD, some participants feel socially constrained hence do not freely participate in the discussion. In a Malawi culture where gender and other socio-cultural power dynamics play a crucial role in verbal expression and social engagement, this emerges as a very relevant consideration. It is the researcher's view, based on experience of moderating the FGDs, that the composition of participants in the FGDs was a fairly homogeneous group thereby promoting a comfortable group dynamic.

A snowballing or chain sampling approach, which involves the use of key informants identified through other initial study participants (Patton, 1990) was used to select participants for KII. In this approach, the researcher initially, purposefully drew up a list of potential study participants for in-depth interview and upon interviewing each of those on the list, each participant was being asked for other key people who might provide useful information for the study. Those people recommended by participants were subsequently approached to participate in the study.

Literature in qualitative research assert that snowballing sampling technique has distinct advantages of being cost-efficient, practical, ease of establishing trust with subsequent participants and soliciting rich information from participants who could otherwise not have been approached (Polit and Beck, 2008).

Consequently, using the snowballing sampling technique and as per eligibility criteria, KII were conducted with the following stakeholders: those involved in child health at policy and management level, City assembly officials, District Health Management Team members; health workers (nurses and medical assistants) from public health facilities serving study settings, and Health Surveillance Assistants (HSAs) from study settings as they mostly provide community health services.

6.2.5 Data collection instruments and methods

Qualitative data collection used Focus Group Discussions (FGD) and Key Informant Interviews (KII). As demonstrated under eligibility criteria for FGD and KII participation, it was decided to use both approaches for purposes of data triangulation and provide a wider scope of understanding from different perspectives.

6.2.5.1 Focus Group Discussions (FGDs)

Prior to undertaking FGDs informed verbal consent (including consent for audio recording of conversation) was obtained for voluntary participation from each participant. In all FGDs, all potential participants granted consent upon receiving verbal information about the study. An interview guide (see Appendix VI) was used to guide FGD in all settings. The FGD interview guide was largely developed by the author based on review of literature and PhD research questions and objectives. A number (5 of 15) of questions were adopted from FGD interview guide used by Munthali et al. (2005) in their study on risk factors to child health among the urban poor in Blantyre city in Malawi. The FGD interview guide included questions on: common childhood illnesses; home management of childhood illnesses; health care seeking practices (including timeliness and health provider preferences); community child care practices from infancy to five years of age; availability of community and health facility services and their perceptions of these services.

Owing to flexibility of qualitative research, data collection instruments can be modified as new information emerges in the course of data collection, effectively allowing for further exploration of some emerging data aspects (Patton, 1990). In this vein, information that emerged from initial FGDs was used to modify FGD interview guide. In spite of the interview guide reflecting key areas of focus, data collection was not rigid hence allowed for exploration of other areas as they developed during discussions.

The FGDs were conducted within the study settings at various places deemed convenient for discussions. For example, in Senti, all three FGDs were conducted at the house of one of the village heads; in Mgona, school blocks and house of village head were used; and a church was used in Ntandire. In cases where FGDs were conducted at the village head's house, the village head was not present to allow for openness in discussions.

The PhD researcher moderated all FGDs and an assistant trained by the PhD researcher took field notes and managed recording of the discussions. The researcher encouraged free flow discussion during all FGDs. All FGDs were recorded using a digital voice recorder and notes were taken during the discussion. On average, FGDs took between 60 and 90 minutes.

6.2.5.2 Key Informant Interviews (KII)

Key informant interviews were conducted by the PhD researcher in key informant's work places under privacy. An interview guide (Appendix VII), generated by the researcher based on research questions, was used to facilitate data collection from policy level informants and health service providers. Key information solicited from KII guides included: common childhood illnesses; existing strategies to promote child health and survival in general and specifically for urban slums; child health policy environment in relation to child health in urban slums; health care seeking practices; and child health governance.

Each participant voluntarily participated in the interview and granted informed consent after either reading the participant information leaflet (see appendix IV) or being explained to about the study. All interviews were audio recorded and audio data collection was complemented by note taking by an assistant in the course of the interview. Duration of interviews ranged between 30 and 75 minutes.

6.2.6 Analysis of qualitative data

Content analysis was used to analyse data from Focus Group Discussions (FGD) and Key Informant Interviews (KII). Content analysis involves identification, coding and categorisation of primary patterns in data and ultimately drawing meaningful relationships (Hsieh and Shannon, 2005, Patton, 1996, Uwe, 2006). It has been widely used in analysing qualitative data and has been lauded for its flexibility of use (Hsieh and Shannon, 2005).

Recorded data from FGDs and KII were transcribed verbatim. Transcripts from FGDs and three KIIs that were conducted in local Chichewa language (mainly for Health Surveillance Assistants) were translated to English. After repeated reading of two FGD and three KII transcripts, a thematic coding approach was used to generate a coding frame. The coding frame constituting superordinate (main) themes and their supporting themes was developed by two researchers (EL and CD) with varying levels of immersion in the qualitative data. The primary researcher (EL) had conducted all FGDs and KII, was involved in transcription,

translation, and undertook detailed coding and development of the themes. The primary supervisor (CD) had read the transcripts and contributed to the development of the themes and structure of the coding frame, drawing upon her expertise and experience in qualitative research (Darker and French, 2009, Darker et al., 2007).

In the iterative process of reading and analysing the transcripts, additional themes emerged and informed modifications made to the initial coding frame. The third version of the coding frame was subsequently used for content analysis of transcripts. Thus two coding frames were used for qualitative data; one for KII and another for FGDs, both of which had undergone the process described above.

A rigorous line by line transcript coding for final analysis was undertaken by the same researchers, independently; the primary researcher and the primary supervisor. Each researcher coded all transcripts. The two met to compare their respective coding for four FGD and five KII transcripts. This process allowed for denoting cases of disagreements in which case further discussion and scrutiny were undertaken to reach consensus and attach appropriate coding or undertake modification of the coding frame.

The primary researcher then compared coding for all the transcripts and calculated an inter-coder reliability to discern levels of agreement in transcript coding. While some authors have contested the appropriateness of inter-coder reliability in qualitative research, its merit in avoiding researcher bias has been recognised and subsequently used in some qualitative studies (Darker and French, 2009, Pope et al., 2000).

In this qualitative study, an average inter-coder reliability of 90% (89.8) was achieved. As cited earlier, application of inter-coder reliability is a recent occurrence in qualitative research and there is dearth of literature on what is an acceptable inter-coder reliability score (Marques and McCall, 2005). Inter-coder reliability scores of 50 – 90%; 66.7% and 80% have been proposed to be generally acceptable in qualitative analysis, albeit dependent on the goal of the research in question (Marques and McCall, 2005). On this basis, the inter-coder reliability result for this qualitative study falls within acceptable optimal scores and is ultimately indicative of the validity of the coding frame; common interpretive understanding and an overall reliable analysis.

6.3 Results of qualitative study design

The major themes that emerged from the results relate to various dimensions and levels of the child health sub-system, namely: child health policy; health service delivery at facility and community level; child care practices at household and community level; and the household-health system interactions. These themes include the following: governance structures and institutional arrangements for child health service delivery; common childhood morbidity and their risk factors; responses to childhood morbidity and patterns of care seeking; barriers and facilitative factors for access to under five child health services; an urban specific child health strategy; child practices at household level with implications on child health; and social determinants of child health in an urban setting.

Due to interconnectedness of the themes, subsequent sections presenting respective thematic results may cross-reference some findings. Furthermore, results presented in subsequent sections use direct quotations to support various themes that emerged. In such cases, pseudonyms are used for purposes of anonymising respondents.

6.3.1 Governance structures and institutional arrangements for child health service delivery

Participants in FGD and KII mentioned various governance structures and institutional arrangements for child health service organisation from policy to implementation at health facility and community levels. In some cases, stark differences emerged in knowledge of policy and implementation aspects suggesting both knowledge inadequacy relating to policy and implementation and/or policy-practice gaps pertaining to child health.

Key Informant Interview participants at policy level indicated availability of national and district level governance structures such as National IMCI Technical Working Group (IMCI-TWG) and an inter-sectoral district Child Survival Technical Working Group.

> (James; Policy level KII): *"These committees exist and they are functional as we meet quarterly to discuss child health issues. At national level, we have the IMCI Technical Working Group and at district level, we have district IMCI group. At both levels there is membership from across the sectors like water, education and even NGOs supporting these interventions. The general role is to monitor what is happening at facility level so as to provide guidance for child survival interventions".*

However, KII at both district and facility levels either lacked knowledge of existence of these committees or indicated that such structures had previously existed but were no longer functional at district level.

> (Uchizi; District Health Management Team member KII): *"Not really inter-sectoral committees at the moment, I am not aware, but we do have programme coordinators like for malaria, Maternal and Child Health and so forth".*

Similarly, at policy and district level management, KII participants indicated that Community Case Management (CCM) was being implemented in urban slums whereas KII at health facility and community level indicated that CCM was not being implemented in urban areas but in 'hard-to-reach' areas of Lilongwe district. Hard-to-reach areas refer to predominantly rural areas of the district for which transportation was inadequate and were farther away from health facilities. Assertions below from KII at child health policy and management level and an HSA from one of the slums exemplify the divergence of responses on this matter:

> (James; Policy level KII): *"In that aspect for Community-IMCI, we have deliberately established what we call Community Case Management (CCM) whereby children who are sick in these catchment areas should be provided with curative services at community level. So when they are sick from fever, malaria, diarrhoea, pneumonia, they can access this service and there is a designated HSA who is trained in that catchment area. .....we ensure that these services are implemented and in those areas you have mentioned, these services are available".*

> (Jane; HSA): *"No, not in my area, but I am aware of my HSA colleagues in the rural areas such as Kauma but not in my area. I am able to distribute condoms and Thanzi ORS but not medicines like Bactrim and Panadol".*

Inadequacy of knowledge on some child health policy arrangements was also evident from key informants (health workers). Specifically, most health workers were aware of a facility based IMCI component but had either no or very little knowledge of Community IMCI.

> (Thandiwe; Nurse KII): *"I don't know about that (Community IMCI), I know of the IMCI in which they train clinicians and nurses, maybe if I can say that....well, is this related to the village health clinic which they are introducing*?"

Various district level child health governance structures were mentioned by key informants. For example, key informants at district management and city council levels indicated existence of Maternal and Child Health (MCH) coordination team. Child health programmes were also cited including: Integrated Management of Childhood Illnesses (IMCI); Acute Respiratory Infections (ARI); Emergency Triage Assessment and Treatment (ETAT); Early Infant Diagnosis (EID) under PMTCT; and Expanded Programme of Immunisation (EPI). Each of these child health programmes had a district programme coordinator. In this respect some KII participants mentioned that there is an overlap in implementation of these programmes and argued that they are better off integrated. An excerpt below reflects this argument.

> (Uchizi; District Health Management Team KII): *"....which is the same with these programmes. They are all addressing child health and are overlapping quite well to an extent. You have ETAT, ARI, IMCI, C-IMCI, EID and so on and you see that they are all addressing the under-five, why not integrate them?"*

With regard to continuum of child health care, the concept of a three tier system in the urban area emerged and the referral process in respect of the continuum of care seemed to be understood by the care givers in the community. In particular, the policy that health centres should be the first point of call (primary care) was understood by care givers in the community. Hence, even when others reported seeking care directly from a tertiary hospital, they admitted it is not recommended, as excerpts from FGDs below entail:

> (Naomi; Mgona FGD 2): *"We have to start with our health centre at Area 25 because they have to write referral notes in the child's health passport, they do not allow to go direct to central hospital".*

> (Mable; Senti FGD 2): *"My child falls sick often and I usually go to Kamuzu Central Hospital because that is where I receive quality health care. Of course it is not allowed (to go directly) but they do not usually send children back as they do with adults".*

With the exception of CCM implementation, KII and FGD participants corroborated on the delivery of the following services at community level: child health immunisation; health education on sanitation, hygiene, child danger signs; environmental inspection; distribution of Insecticide Treated Nets (ITNs), Oral Rehydration Salts (ORS); and referral. Health

Surveillance Assistants (HSAs) were cited as a significant cadre of health workers providing these community oriented activities. Community health volunteers were also mentioned as providing auxiliary role to HSAs in the communities. This notwithstanding, care givers' contributions were divergent with regard to HSA's community work, and frequency of community visits. Whereas some care givers reported knowledge of HSA's existence and community work in the areas, few others reported not to be aware of their existence and community health volunteers as they claimed their households had not been visited. Nonetheless, the general perception was that HSAs are available but in many cases their community visits are infrequent as posited below.

> (Veronica; Mgona FGD 1): *"They (HSAs) do come especially if there are health campaigns such as mass distribution of mosquito nets, during child immunisations, cholera campaigns or deworming campaigns. Other than this the visits are not frequent and not exactly scheduled".*

The delivery of child stimulation activities was also cited. Key informants at policy level indicated that as per child health and survival strategy, Community Based Child Care Centres (CBCC) are established in communities to provide various services for child mental development. These were said to be available in the slum areas. The relevance of this type of service and its institutional arrangement is indicated in a policy level KII.

> (James; Policy level KII): *"We have children that are not yet going to school but they need early learning, they need mental development and stimulation early in life other than wait for them to start attending school. So in those catchment areas, we have established Community Based Child Care Centres (CBCC) and these are supposed to provide services such as child protection; playing; early learning and stimulation. These are preliminary life setting.....so that becomes very essential as you know child's life begins between 0-3 years and if those years are messed up then the child's future is 'gone'".*

However, only few FGDs reported existence of these CBCCs in the three areas. Some care givers even indicated lack of knowledge of such services. Nonetheless, a CBCC infrastructure was observed in Mgona but not in Senti and Ntandire even though some care givers in Ntandire reported similar services near the house of the chief but meant for orphans.

(Mary; Ntandire FGDs 2): *"At the CBCC close to the village headman's house, they have a playground for children where they play games like soccer, see-saw and a few other things. They also prepare some meals for them especially porridge. I think kids really enjoy being there".*

(Brenda; Ntandire FGD 3): *"We really would not say that we have a CBCC of our own here. The closest we referred to is meant for orphans but there are not that many games and equipment there. The other one on the other side, our children do not really go to play there".*

6.3.2 Common childhood morbidity and their risk factors in urban slums

Four childhood disease conditions were cited as being the most prevalent in the three urban slums. A similar pattern of childhood morbidity was noted in all three areas of Senti, Mgona and Ntandire as noted from FGDs in all the three areas and by health workers from health facilities serving the three areas. Whereas subtle differences were noted across FGDs in terms of ranking childhood morbidity by perceived prevalence, malaria, diarrhoea, pneumonia, and coughing or flu emerged as the most prevalent childhood disease conditions. Health workers also cited the former three and added child malnutrition (under-nutrition) as another most prevalent childhood condition in the three areas.

Care givers in FGDs cited various risk factors contributing to childhood morbidity in their setting. The factors that were mentioned in a majority of FGDs include the following for diarrhoea: proximity of toilets to houses; lack of hand washing; improper disposal of child excreta; unhygienic food preparation; and using unsafe water especially when water kiosks are broken down.

(Temwani; Ntandire FGD 3): "*Due to small land spaces, pit latrines are close to houses and that is more common in houses that are down there (*pointing to another side of the slum*), where they are very overcrowded".*

(Joana; Mgona FGD 1): *"Sometimes the food is uncovered and the flies from toilets will land on the food, so that may bring about diarrhoea due to contamination".*

(Jane; Ntandire FGD 2): *"Sometimes, it is the fault of mothers. We change nappies and then without washing hands we breastfeed the child or prepare food".*

Risk factors for malaria were cited as: presence of stagnant water in the vicinity of houses; and inability to use ITNs as exemplified below.

(Charlene; Mgona FGD 3): *"Not sleeping under a mosquito net and presence of stagnant water pose risks for malaria".*

Moreover, an extract below from the same FGD 2 in Ntandire underscores the prominence of water stagnation as risk factor for malaria in the urban slum setting:

Hillary: *If a rubbish pit is close to the house and is filled with water, it brings mosquitoes which multiply a lot.*

Researcher: *And does that happen here in Ntandire?*

Sibongile: *Yes it happens, and sometimes water from bathrooms also contribute to the same and it settles somewhere near the house and people do not drain this water at times, this happens here.*

The risk factors mentioned for pneumonia included: not covering the child with warm clothes especially when it is cold and children playing in the rains.

> (Chimwemwe; Ntandire FGD 3) *"If we allow children to play in the rains or do not keep them warm, they develop pneumonia because of the bad weather".*

6.3.3 Responses to childhood morbidity and patterns of care seeking

Under the theme of responses to childhood morbidity, three key areas were discussed in FGDs and KII and they include: home management of childhood illnesses; health care seeking; and whether care was sought timely.

6.3.3.1 Home management of childhood illnesses

In all FGDs, care givers mentioned various ways of home management of fever and diarrhoea but indicated that for pneumonia they do not undertake home management, rather just take the child to the hospital. Home management of fever that emerged from all FGDs entailed: sponging the child with cold water; bathing the child with lukewarm water; removing clothes so that the child's body cools with fresh air; and giving the child antipyretics such as Panadol or Cafemol.

(Ellen; Senti FGD 2): *"Sometimes the child develops fever, say at midnight, and you cannot walk to the hospital. When the fever is high, we wipe the child's body with a wet cloth and the fever eventually drops".*

In some FGDs, some care givers indicated a combination of antipyretics such as Panadol and Cafemol. Wide variations were noted with regard to dosage and frequency of taking the antipyretics, some of them indicating dosages appropriate for child age while others were large dosages relative to age of the child. For example, in one FGD in Ntandire, some care givers mentioned that a child of about 8 months may be given a tablet of cafemol in combination with quarter tablet of Panadol. Conversely, some care givers from one FGD indicated that they do not give children's Panadol because of the perception that it is not effective hence they prefer Panadol meant for adults.

(Malita; Mgona FGD 2): *"We do not give panadol meant for children for it is not very effective because it is sweet. So we take Panadol meant for adults and then break it into half or quarter and give the child".*

In all FGDs, the use of Oral Rehydration Therapy (ORT) was cited for home management of child diarrhoea. Thanzi ORS which is a local branded Oral Rehydration Salt that is subsidised and being actively promoted through social marketing was commonly cited in this regard.

(Mirriam; Senti FGD 1): *"We give Thanzi ORS. Sometimes it happens that you already have the ORS, it may have remained from the one you received from the hospital during the child's previous diarrhoea episode, so we just take the same and use".*

However, care givers mentioned that in the event that they fail to access Thanzi ORS, they use a sugar and salt solution and give the child frequently. An illustration below attest to the use of ORS improvised solution:

(Monica; Mgona FGD 1): *"In the event that we do not have money to buy Thanzi ORS we also mix sugar and salt. What we do is we boil water and then use that water to dilute sugar and salt and then give the child frequently. It works the same way as ORS and it's cheaper considering that not everybody would have money to buy ORS all the time".*

Continued breast feeding and giving child water were also mentioned as home management of diarrhoea. Some care givers in some FGDs also mentioned the use of flagyl and bactrim at home for management of diarrhoea. In all FGDs, local shops were cited as the commonest source of drugs used for home management. Other sources cited in a few FGDs included medicines remaining from a previous dosage given at a hospital, friends, and purchasing from some private clinics.

6.3.3.2 Health care seeking from a health provider and timeliness in care seeking

With regard to care seeking from a health provider, care givers in all FGDs suggested that despite numerous challenges that they face with their hospitals, the majority take their children to the hospital. This notwithstanding, they cited that other care givers do not take their children to the hospital. Typical responses to discussions pertaining to health care seeking from health providers were as cited below:

> (Martha; Ntandire FGD 2): *"Most of care givers go to the hospital. Others just buy medicine and administer them at home, they are lazy to go to the hospital"*.

Furthermore, whereas there was a seemingly universal indication of positive health care seeking practices in FGDs, subsequent discussions unearthed various barriers to access of under-five child health services, among which care givers indicated resulted in them not seeking health care. These barriers are discussed later in section 6.3.4.

Discussions around whether health care is sought timely for the sick child attracted various differing assertions. While some FGDs predominantly indicated timely care seeking, in most cases immediately the child exhibits symptoms or the next day, others suggested that care givers play a watchful waiting approach and end up delaying in care seeking. Two FGD quotes below illustrate these assertions:

> (Tapiwa; Senti FGD 2): *"We normally go immediately we notice the child has symptoms. Sometimes it happens that the child falls sick at night, we go the next morning. Of course others delay in going"*.

> (Chimwemwe; Mgona FGD 3): *"Many people wait, they think the child's condition will get better and they buy Panadol and when it is getting worse they buy Bactrim before they go to the hospital when the condition is not improving. Some wait even up to*

three days. There are few people in this area who go to the hospital immediately the child gets sick".

However, most health workers in KII mentioned that in most cases care givers come to the health facility late as they sometimes wait three to four days before they seek care. Health workers especially at the facility level also suggested that care givers initially start with traditional medicine.

(Uchizi; Medical doctor): *"....yet on the other side, they will have visited the traditional doctor who gives all sorts of reasons, they could have visited him three or four times before they decide it is time to go to the hospital.....or say until that child is almost unconscious and then they rush to the hospital and they say the hospital did not help us. But that's because we are the last stop".*

Discussion around the use of traditional medicine attracted mixed assertions with the majority of care givers in FGDs acknowledging availability of traditional healers in their area but further indicating that very few use them for child health. However, most care givers in almost all FGDs indicated that other than traditional healers, there are elders in their communities who know some medicine and they are sometimes the first point of contact. In this respect.

(Wongani; Senti FGD 2): *"There are no traditional healers here but there are elderly people who know traditional medicine as they have known these issues for a long time and also from their experience of rearing children in their time. So sometimes when the child is sick, they tell you to use some medicine and it helps, you see that the child gets better".*

In spite of the debates around the use of traditional medicine primarily for conditions such as malaria, pneumonia and diarrhoea, there was apparent consensus among care givers in all FGDs that there are some childhood illness conditions for which they believe are better managed by traditional medicine. Various conditions were cited with their *Chichewa* names. These include *chigwewu (*form of diarrhoea with severely inflamed anal area*); liwombo (*bulging or depressed fontanel*), litata (*tongue tie*); mawuka (*persistent child fevers believed

to be due to maternal vaginal warts); *kapamba* (enlarged spleen); and *kalongolongo*. An illustrations below emanating from a purported experience underscores this belief:

> (Zione; Ntandire FGD 1): *"Yes, like my child was suffering from 'liwombo'. I had gone to many hospitals including the central hospital, MIM, Area 18 health centre and even private hospitals but the child never got better. When I went to the traditional healer I was told it is 'liwombo' and the child was assisted with medicines and eventually got better".*

6.3.4 Barriers and facilitative factors for access to under five child health services in urban slums

Various factors related to demand (care giver, household, child) and supply (health system) were cited as barriers or facilitative of seeking health care for under-five children. Since the absence or presence of a particular health system attribute can be a barrier or facilitative factor, the two are discussed together in this section. More importantly, the pattern of discussions in FGDs and KII within this area reflects this combined pattern. For purposes of clarity, presentation under each of the factors will predominantly reflect barriers to health care seeking considering that they (barriers) also reflected the predominant expression of discussions. However, it is noteworthy that the opposite of each barrier represents a facilitative factor for health care seeking for child health services.

Health system factors such as: availability (or lack of) medicines and supplies; waiting time; attitude of health workers; nature of examination of the sick child; opening time of a health facility; and distance emerged as important determinants of care seeking of under-five child health services. On the other hand, household financial resources; care givers' religious and cultural beliefs in traditional medicine were cited as demand side determinants. The subsequent sections highlight findings under each of these factors.

6.3.4.1 Lack of medicines and medical supplies

Inadequate supply of medicines and other medical supplies emerged as a salient recurring theme in FGDs and KII at both policy and service delivery levels. It was cited as a barrier to seeking health care for under-five year old children, especially from public health facilities, in all FGDs. Participants in all FGDs claimed that as a consequence of inadequate supply or unavailability of drugs at the health facility, they are either given an incomplete dosage of

prescribed medicines (for example one type of medicine instead of two that are prescribed and not necessarily fewer tablets of the same drug) or are not given at all. An excerpt below illustrates this phenomenon:

> (Dumase; Ntandire FGD 3): from *"Sometimes the health facility does not have medicines available and they end up giving inadequate drugs. If you come to think of it, we travel long distances to get there so if you consider going to a hospital under those circumstances you just get discouraged and stay at home. At that time the child is getting worse and by the time you really have no choice but to go, the child is so weak. All this is because you initially took an initiative and went to the hospital but you received inadequate drugs because if you had received all appropriate drugs in adequate amount, there was not going to be reason that you go again since the child should have recovered".*

Besides unavailability of medicines and supplies, care givers also expressed some dissatisfaction with only being given analgesics when they expected to receive different or in other cases additional medicines. Receipt of analgesics alone (especially Panadol), whether appropriate for the child's condition based on health assessment is usually a discouraging factor that affects subsequent utilisation of child health care.

> (Paulina; Ntandire FGD 2): *"....if you seriously think of the distance you have travelled, the time it took for you to wait for help at the facility and the total time you spend away from home only to receive Panadol, you get discouraged. You just feel like you have wasted your time and you were better off buying Panadol from the shops around here".*

The importance of availability of medicines and medical supplies also emerged in some key informant interviews especially with health workers at the health facilities as a determinant of care seeking among care givers and a challenge for service provision among health workers. Evidently, during one of the KII at one of the public health facilities, a health worker indicated that at the time of interview, some essential drugs were out of stock at the health facility and that care givers were being requested to buy for themselves.

(Thandiwe; Nurse KII): *"When they come they expect to find drugs and if we are out of stock of some drugs and we ask them to go and buy, they certainly get discouraged. Like there are times when for a full week we do not have essential drugs like anti-malaria or Bactrim".*

6.3.4.2 Waiting time at a health facility

Waiting time also represents one of the prominent themes cited in all FGDs and the majority of KII. Discussions pertaining to waiting time especially among care givers related to the time taken from the moment a care giver arrives at the health facility to the time she leaves for home after receiving health care assistance for her child. Divergent opinions emerged on reasons attributable to long waiting times.

Health workers emphasised long queues and a critical shortage of staff to cater for the demand for under-five child and adult health services on a day to day basis as the following statement implies:

(Julita; City Council Community Health Nurse KII): *"...the population is growing and so is the demand for health services....Right now our capacities cannot meet the demand. So now the danger is,...as I have said in our under-five health outreach clinics we want to relieve congestion at Bwaila hospital but when we conduct those sessions and we keep mothers from early morning up to afternoon, which is a long time, it is a demotivating factor. They do not like to wait for long".*

Care givers on the other hand, while also citing long queues as posing challenge and contributing to undesirable long waiting times, emphasised late opening of health facilities and long lunch hour breaks by health workers. They claimed as follows:

(Tamara; Mgona FGD 2): *"....and nowadays there is a system that they have to stamp your child's health passport before you go for consultation with the doctor. Sometimes you get situations where the doctor is available to examine the child and yet the person at the registration area is not there to stamp the child health passport so you have to wait. He comes around 11AM and stamps the health passport and you go to see the doctor and by the time you go to the pharmacy to get prescribed medication you are told the pharmacy technician is gone for lunch and you have to wait again until he*

comes back may be around 2pm or 3pm. All that time, would you or your child not be unconscious if you were severely ill".

6.3.4.3 Opening times of health facilities

In addition to contributing to long waiting times, delay in opening of the health facility also emerged as an important barrier to seeking child health services in its own right. Care givers in FGDs indicated frustration with late opening times of health facilities in the morning and re-opening after lunch break. Two illustrations below underscore care givers concerns:

(Elizabeth; Senti FGD 1): *"...it happens that even when we go to the hospital at 5AM to beat the queue, the doctor comes around 9AM or even after 9AM".*

(Palisha; Mgona FGD 2): *"They have indicated on their signpost that they will be starting work at 7:30AM but they even stay up to 9AM before they start working. This disappoints people. As a result, some people go to private clinics if they have money".*

Furthermore, discussions on this theme also implied that at certain times of the day, health facilities are seemingly inaccessible as health workers sometimes question the timing of seeking health care. Some care givers reported that going to some health facilities in the afternoon attracts the discontent of health workers which ultimately discourages them (care givers) to seek care at certain times of the day. This assertion is exemplified by the following remark:

(Hilda; Mgona FGD 2): *"...sometimes a child wakes up well but then gets a sudden fever around noon but when you go to the hospital they shout at you saying sick people do not come in the afternoon, they come early. And you do not know what to do so you keep on waiting. They will eventually assist but very late and during which time they don't undertake proper examination but just give say four Panadol tablets and break them into half. You go back and the child does not get better so you just go somewhere else like private hospital if you have money".*

This theme represents one of those predominantly cited by care givers but did not feature among key informant interviews at policy and health service provision levels.

6.3.4.4 Attitude of health workers

In all FGDs, negative attitudes of health workers was cited as a significant barrier to effective utilisation of under-five child health services. Care givers mentioned various examples of negative attitude of health workers mostly relating to; negative verbal expression, not being adequately attended to when they complain, favouritism of friends or some elite members of the community. Two assertions below provide evidence.

> (Mercy; Ntandire FGD 1):*"...you wait for a long time and you see that your child is getting weak and some health workers are just chatting but when you go to complain they retort that of all the people on that queue, who do you think you are to come".*
>
> (Tawene; Mgona FGD 3): *"We get insulted and you may think like you have been cursed".*

Despite the fact that negative attitudes emerged as a critical factor as evidenced by its recurrence in all FGDs and particular dominance in each of the FGDs under the discussion pertaining to barriers, FGD participants also cited that there are health workers who treat them with respect, as the remark below attests.

(Brenda; Senti FGD 1): *"...it depends with the doctor you find. There are some doctors that treat you well and we are satisfied with the care we receive but there are other doctors, when they give us medication, we are not really satisfied".*

To this extent, others cited names of the exemplary health workers who provide the patient centred care which they (care givers) assert attract them.

Some health workers also acknowledged during key informant interviews that there are elements of negative verbal expressions towards care givers by some health workers which would consequently deter seeking health care. Two illustrations below, one from a community health nurse and another from a Health Surveillance Assistant attest to this recognition:

> (Julita; Nurse KII): *"Sometimes the way care givers and patients are treated may be discouraging. I know there have been reports of negative attitudes by some health workers, I am not so sure if it is still a big problem but it definitely is a barrier".*

(Joyce; HSA KII): *"The way some health workers treat clients at a facility also discourages them in most cases but our clinician here treats people very well regardless of the time they arrive. For this reason we even have people coming from other areas seeking care at our facility".*

6.3.4.5 Nature of health examination of the sick child

Care givers reported that how their sick child is examined determines their satisfaction with health care received and this ultimately influences care seeking decisions in subsequent childhood illness episodes. This also emerged as a recurrent finding cited in all FGDs and some few KII with health workers. Care givers indicated that in many cases, they are dissatisfied with the suboptimal examination usually characterised by: hurried collection of subjective health information of the child from the care giver; lack of physical examination or laboratory tests and lack of or inadequate explanation pertaining to findings on illness of the child and associated treatment.

For example, in almost all FGDs, participants reported that often times health workers start writing the information pertaining to illness of the child as explained by the care giver (subjective health information) and before the care giver finishes explaining, the health worker has already finished writing and has even written a prescription. This assertion is better illustrated by the remark below:

(Siphiwe; Ntandire FGD 1): *".....the doctor writes as you are explaining, but before you finish, he has finished writing and is giving you the health passport. I think it's just rude and inappropriate. But it happens. As we walk back home we share experiences and we realise we have just wasted time and we should just have bought drugs from a shop. You give the child the drugs they prescribed and the child does not get better and that's probably because they were inappropriate drugs in the first place because they did not adequately get my explanation. So we have serious concerns".*

In other cases, some FGD participants, while acknowledging the suboptimal examination as a source of dissatisfaction, noted that the extreme workload on health workers may contribute to this phenomenon in some cases. In illustration, *Martina*, agued as follows

(Martina; Ntandire FGD2): *"...sometimes there are large numbers of patients. There are few free hospitals so due to monetary problems we all rush to these free government hospitals. For instance may be you have 500 or 600 patients against one doctor, they must be really tired and we should just understand them. In this way some get appropriate care while others do not. The problem is shortage of hospitals and staff".*

Other aspects of examination of the child mentioned included the lack of privacy and confidentiality. Some FGD participants and KII mostly those involved in community health care service provision indicated that sometimes three or four care givers are asked to enter the consultation room at the same time which limits the freedom of expression among care givers and ultimately demotivates them. A statement below underscores this assertion

(Julita; Nurse KII):*"...what also discourages mothers is lack of proper infrastructure, privacy and confidentiality. Because, imagine if I am HIV positive and my child may be has contracted HIV and he is malnourished or suffering from other problems, and here I am on an open table discussing this, being asked 'what is wrong with the child?'. The mother cannot tell you what is wrong with the child. That information is confidential so lack of privacy hinders mothers in our health facilities".*

6.3.4.6 Shortage of health workers in health facilities

As noted in the preceding sections on waiting time and nature of examination, shortage of health workers was cited as a significant barrier which certainly cuts across various facets on the health service supply side. The majority of health workers in KII also cited human resource challenges in health facilities as one of the major reasons they cannot provide optimal care for under-five and general health services. In particular, the following assertion attests:

(Vivian; Medical Assistant KII): *"Like today I was alone against 200 or more in the under-five Out-Patient Department (OPD) not mentioning the numbers in the adult OPD that I also had to attend to. In this way, I cannot give people all the attention they deserve and need".*

Whilst not commonly expressed among key informant interviews, the use of other low level cadres to perform some functions that may be outside their scope as a strategy to cover the

shortage and still provide some minimal care to clients, was reported. For example the use of Health Surveillance Assistants to perform some nursing functions was the case in point. A statement below underscores this assertion:

> (Thandiwe; Nurse KII): *"There is acute shortage of health workers. There are other times when there are just two of us (nurses) at a health centre. In that case we leave the under-five clinic to HSAs and may be one clinician who looks after the under-five and adult OPDs, so that's the number one challenge".*

6.3.4.7 Distance to health facility

Distance to health facility was cited as an important factor determining care seeking of under-five health services. This theme emerged in all FGDs in Ntandire whereas it was cited in only three of the five other FGDs in Mgona and Senti. Consequently, FGD participants from Ntandire mostly expressed the need for health infrastructure within their area as one way of promoting the health and survival of under-five children. To underscore this assertion, an HSA serving in Ntandire indicated as follows:

> (Bettie; HSA KII): *".....the immediate need would be the hospital within Ntandire because there is a long distance for people to get their sick child to the nearest public health facility. In the past we have lost children (to death due to not seeking and late seeking of care) because of the long distance they have to travel to a health facility".*

Furthermore, the specific need of health infrastructure in Ntandire emerged in a KII with a health official from city council where it was indicated that the people of Ntandire cited the need for a hospital as one of their critical needs and demanded inclusion of this aspect in one of the project plans to be implemented in the area by a philanthropic organisation, the Bill and Melinda Gates foundation. The residents reportedly insisted that a hospital was one of their priorities, even when the organisation indicated that infrastructure development was not within their project scope.

Whereas distance to a health facility was viewed of lesser dominance in Mgona and Senti relative to discussions in Ntandire, in both settings, concerns about travelling to a health facility in the event of a childhood illness at night were more prominent for security reasons, as evidenced by Amita's comment.

(Amita; Senti FGD 2): *"Most of the times, transport is a problem especially if the child gets sick at night, we cannot walk so we have to wait till morning".*

6.3.4.8 Cost of health care and household income

Cost of health care and household income emerged as two inseparable factors that are a barrier to access to child health services. Due to the predominant use of public health facilities that provide free health services at the point of use, the cost of health care did not emerge as an explicit theme suggestive of its deterrent effect to access of under-five child health services. However in almost all FGDs, participants reported mostly being averse to use of private health facilities due to household financial inadequacy. Expressions such as *'...in other cases we have no choice, so those who have money go to private health facilities'* were common.

In this regard, one FGD (FGD 2) conducted in Ntandire provided information regarding some costs of health care in private health facilities. Furthermore, care givers suggested that despite numerous problems, they still use public health facilities because financial requirements are only on other items such as transport (not health care itself). As one care giver indicated:

(Sophie; Mgona FGD 2): *"...we still prefer the government health facility because you only need to find money for transport, and even when you don't have you can walk, knowing you will receive some help for your child but private clinics require money".*

As implied in the excerpt above, in addition to the cost of health care, other associated costs such as transport to the facility; and purchasing medicines as is the case when prescribed medicines are out of stock at the health facility, also emerged.

Some KII also indicated the deterrent effect of limited household finances pertaining to accessing health care for their children. In addition, some health workers reported experiences where referral is not complied with as care givers indicate that they do not have money for transport to enable them travel to the facility which they may have been referred to.

(Emily; Medical Assistant KII): *"Sometimes we refer them to central hospital and they say they cannot go because they do not have money for transport".*

6.3.4.9 Sociocultural and religious beliefs

Sociocultural and religious beliefs emerged as an important determinant of care seeking for child health services albeit there were divergent views in some aspects between findings from FGDs with care givers and KIIs that were predominantly conducted with health workers. Stark differences were noted with regard to beliefs in traditional medicine. On the one hand, majority of health workers indicated that some care givers have initial contact with traditional medicine either from elders in community or traditional healers before going to the hospitals. On the other hand, while acknowledging existence of such practices, care givers in most FGDs indicated that the practice is negligible. However, the use of traditional medicine for some illnesses perceived not to be curable at the hospital was acknowledged (as presented in section 6.3.3.2). Furthermore the practice of using traditional medicine for some aspects of child care (with health implications as presented later in section 6.3.6) was also acknowledged in most FGDs.

The influence of some religious beliefs on health care seeking for the ill child was a common theme from FGDs and KII even though it was indicated that it relates to a small section of religious grouping and society. Two illustrations below are cases in point:

> (Juliana; Mgona FGD 2): *"...some women do not go to the hospital with their sick children because they are Zion believers and they believe that God will heal their child".*
>
> (Isabella; HSA KII) *".....there were religious groups like Zion, which due to their beliefs, were preventing people from childhood immunisations over a period when we had measles outbreak....".*

6.3.4.10 Autonomy of care givers in care seeking decisions

Autonomy of care givers with regard to decision making to seek health care for a child was specifically explored in this qualitative inquiry. In all FGDs, participants indicated that while the husband is regarded as the head of a household, women as primary care givers have the decision making power to seek health care for a child.

Even in cases where the husband is not around, it was reported that mothers take the sick child to the hospital and only inform the husband by phone or after they are back from the hospital, as the statement below postulates:

(Chipiliro; Mgona FGD 3): *"We think and decide on our own. Waiting for the father of the child means the child is being delayed to receive medication because the husband leaves home early in the morning for work and the child stays with the mother. If we wait for the father then the child's condition might worsen so we just go to the hospital if we have to".*

However some few health workers reported of low decision making powers by women and further suggested that this was one of the reasons attributable to delay in care seeking for child health services.

(Uchizi; Medical Doctor KII): *"... the other deterrent relates to social factors. There is a social belief that it is the mother who takes the child to the hospital yet the mother has to wait for the father for the approval to go to the hospital. So if the father is away, the mother knows that this child is sick, she will have to wait first to tell him and he will provide the money and consent for the mother to take the child to the hospital. All that is a lot of delay, a lot of red ink in the community. By the time you are through, a lot of time is lost".*

6.3.5 Child health strategy that is context specific to urban slums

Discussions pertaining to whether an urban health agenda that in part elucidates child health strategies in the urban slum context existed, were undertaken with participants of key informant interviews at both policy and health service provision levels. All KII participants indicated that such an agenda was non-existent. Even at District Health Office (DHO) level under whose jurisdiction the urban slum areas fall, KII participants indicated that there was no specific or targeted interventions for under-five children in urban slum areas.

(James; Policy level KII): *"What we have at the moment is standardised implementation of our policy. We have not isolated particular vulnerable or disadvantaged groups and say that this is how we will implement".*

(James; Policy level KII): *"As a Ministry of Health and a programme that looks at child health services, there isn't a particular intervention focus that looks at settlements that are not legal but we have established institutions and health posts and dispensaries to*

ensure that services are available. They can access those services but there is no focus to target a particular area".

With reference to not implementing community case management in the urban slum areas, some key informants indicated that this programmatic element is implemented in hard-to-reach areas and urban slums do not meet that criteria considering their proximity to health infrastructure within the city. An extract from one of the KII with a medical assistant below exemplifies this:

Researcher: *So is the Community Case Management (CCM) being implemented in urban slum areas like Mgona as your catchment area?*

Judith: *I do not know about Mgona but we have HSAs who are rendering those services (CCM) but only in real hard-to-reach area.*

Researcher: *I see, so Mgona, does it fit that criteria or..?*

Judith: *No, Mgona is easy to reach, it does not need that service, it is close to the hospital.*

Consequently there is an implicit indication that distance to health facility is regarded as the primary determinant of access to child health services.

The present child health policy content notwithstanding, during further discussions, KII participants were asked for their opinion on the necessity of targeted health interventions for under-five children in urban slums considering some context specific health challenges. In this regard, all participants indicated that indeed there are specific health challenges in urban slums and that targeted interventions are warranted. The following statement provides an example:

(Uchizi; Medical Doctor KII)*:"We need to focus on these urban areas now.....you know as time goes these urban areas will pose greater risk. It is something which we have to look at otherwise under-fives will have five episodes of pneumonia within a short time".*

In the same vein, a KII participant at national policy level also remarked as below (extract combined from two separate but related statements):

> (James; Policy KII): *"Towards the end of this year, we will be revising our policy and hopefully we can put this in context, based on needs and environment. And in terms of situation of individuals and groups, that should obviously be looked at to see how best we can address those issues. ....I think your subject will get us thinking of what are the best interventions to undertake in urban or peri-urban areas. It's one of the issues the Ministry has to look at and work with districts and NGOs so that services are provided adequately".*

6.3.6 Other child care practices at household and community levels in urban slums with implications on child health

This qualitative study also sought to find out other child care practices with implications on the health of under-five year old children in urban slums. Main aspects of this theme were breast feeding, and care of the umbilical area after birth.

Discussions pertaining to breastfeeding focussed on initiation of breast feeding after birth of the child, colostrum feeding, exclusive breast feeding and whether pre-lacteal practices existed in the urban slum areas. In all FGDs, care givers mentioned that breast feeding is initiated immediately after birth or within few minutes of birth. In all areas, care givers indicated that there are no specific beliefs pertaining to colostrum feeding and that colostrum is fed to the new born and has high nutritional value. Similarly they indicated that they do not give pre-lacteals to new born babies.

However some care givers in almost all FGDs also indicated that some traditional medicine are provided to new born babies as remedy for colic pain. Care givers mentioned the use of *matumbo a simba (*intestines of an animal that resembles a cat*)* as a traditional remedy. The intestines of *simba* are soaked in water and the child is given that water to drink and relieve colic pain. Gripe water was also frequently cited as modern medicine of colic pain that is also given to children in early months of birth.

With regard to exclusive breastfeeding, there were mixed opinions among care givers. While some indicated that women breastfeed exclusively for six months before they can start

complementary feeding, others indicated that in reality, complementary feeding starts at about three and four months. These two divergent views emerged from all FGDs albeit the majority in each FGD indicated that exclusive breast feeding for six months was unrealistic. The two extracts below from FGDs in Senti and Ntandire affirm this assertion:

> (Sophie; Senti FGD 2): *"If we say strictly six months exclusive breastfeeding then we are not being honest. The common practice is that most women introduce complementary feeding early. They say my child keeps on crying and I think she is not getting satisfied so I will just start her on soft porridge".*

> (Fatima; Ntandire FGD 3): *"Some people manage to breastfeed the child exclusively for six months but others say the child is giving me problems with frequent crying and their friends advise that they should start him on soft porridge early because it is due to hunger. This is not good because they overload the child as the intestines are not fully developed".*

Another key aspect of child care practices discussed was the care of umbilical area after child birth. Various views emerged on how the infants umbilical are is taken care of but there were similarities in practices across the three slum areas. Care givers mentioned undertaking practices as advised by health workers but also based on their traditional beliefs.

The application of methylated spirit, and washing with clean water represented two practices for care of the umbilical cord stump that care givers mentioned as being advised by health workers. As per traditional practices, care givers in all areas cited applying the following on the umbilical cord stump: *nsitu* (solid particles of smoke that gather on the kitchen ceiling), *litsiro la musi (*dirt from pounding pestle)*; excreta from mice; and breast milk.* The first two were the most frequently cited in the majority of FGDs even though some care givers mentioned they are practised by a minority.

6.3.7 Social determinants of child health in an urban slum setting

The thematic area of social determinants of child health in urban slum areas under study emerged both explicitly and implicitly in FGDs and KII. Various aspects of social determinants of child health were mentioned in the course of discussing risk factors to child health and in

discussions pertaining to what participants recommended as key strategies to improve child health in urban slum settings.

Among the salient topical areas under this theme was the inadequacy of sanitation and the subsequent need to improve sanitation in all the three areas albeit Mgona featured highly with regard to having many households using one pit latrine. In all three areas of Senti, Mgona and Ntandire, FGD participants mentioned that household sharing of pit latrines was a common phenomenon. This, they cited was due to inadequacy of space and also that many people live in housing blocks or small house compounds that belong to one landlord who usually provides one toilet for all houses. To this end, care givers mentioned that on average up to six households use one pit latrine and that in extreme cases even twelve households. The following quotes from Senti FGD 2 underscore this assertion:

> (Mercy; Senti FGD 2): *"Others don't have toilets, especially during rainy season like this one, the toilets fall down and it happens that the whole plot is using one toilet or sometimes people from other plots also use the same toilet".*
>
> (Favour; Mgona FGD 3): *"Yes and there are many people, even many from one house. For example four people from one house, three from another and so many others from other houses, and all these people use one toilet".*

During a KII, one participant mentioned that there was an NGO that was implementing a sanitation improvement programme in Ntandire by providing toilet slabs but the programme had stopped. Consequently, in the majority of FGDs and almost all KII, sanitation was regarded as one of the key problems implicating on child health and warranting attention.

Overcrowding also emerged as a key social determinant of child health warranting attention. This was mentioned in two facets namely; too many people living in one house; and two many households on a very small land space (high population density). The implications for child health that predominantly emerged from KII were: ease of infection transmission and disease outbreaks. For example, an HSA serving in one of the areas indicated that while they have not had a cholera outbreak recently due to effectiveness of community health projects undertaken, the risk of a massive spread was still present. Another key informant from a multilateral organisation corroborated this viewpoint as follows:

(Lloyd; UN-HABITAT KII): *"Actually, if you hear of a cholera outbreak in Lilongwe, you will notice that it is those areas that are affected or it may have started from there".*

To underscore the significance of inadequate sanitation and overcrowding as determinants of child health in study areas, one HSA noted as below during the KII:

(Linda; HSA KII): *"Government should do everything possible to help especially to reduce overcrowding through housing programmes. It (referring to one of the areas) is not a very nice place, with many health risks. For example, there is a house facing a toilet and refuse disposal pit close by and then another house just close to it. Even when I work there, it's just that it is my catchment area but it's not a nice place. And it is a big area with so many people and even the work is too much for one person".*

In all three areas, Water Aid, an NGO had a programme of improving access to safe water and water kiosks were installed. However, care givers and community health workers cited that the use of unprotected water from the river is still prevalent especially when the kiosks break down.

(Judith; Medical Assistant KII): *"There are times when residents use water from Lingadzi river, so there is still risk of waterborne diseases to their children".*

The high prevalence of poverty that impacts on health care seeking and access to other commodities that would promote child health was also cited. Some care givers in FGDs reported financial barriers to access private health facilities or buy prescribed medicines even in the event of failure to access appropriate medicines in free public health facilities. Similarly some health workers reported instances of reported failure to comply with referral due to financial constraints. Consequently, projects to improve household income were recommended by care givers in FGD and KII participants.

In addition to the aforementioned social determinants of child health, one key informant elaborated an additional risk factor that did not emerge in any of the KIIs or FGDs. This factor relates to psychological pressures of urban slum residence which, as he argued, may have both indirect implications on health care seeking and health outcomes. The key informant argued that psychological pressures lead to stress which may compromise effective use of

health services but also pose risk for mental health disorders, as the observation below entails:

> (Uchizi; District Health Management Team Member KII): *"We have to look at it now otherwise those currently under-five grow up with years passing, by the time we look back they might just have fallen into mental illness because they started substance abuse at the age of twelve or thirteen".*

In light of the social determinants of child health, some KII participants noted that at city council level, there were plans to implement slum upgrading programmes. Specific details of this initiative were not provided but the general picture was that the project is meant to improve social determinants of health in the slum areas. At the level of health policy, a key informant within the Ministry of Health posited that the entire child health and survival initiative is implemented using a multi-sectoral approach which entails different sectors and organisations working together to address child health and its social determinants. An extract below illustrates this claim:

> (James; Policy level KII): *".....IMCI is implemented under human rights approach to programming and so issues of child protection, security, and safety including food security as well are included.....Issues of child health are addressed as holistic as possible. We do not just talk about health, but the key element is that we would want to make sure that the NGOs are supporting and implementing those high impact interventions in totality".*

6.4 Discussion of findings of qualitative study

This qualitative study found various policy amenable factors at household, community, health system and the macro socioeconomic environment that affect child health and survival in urban slum settings. These are discussed in the proceeding sections particularly focussing on: child health governance; under-five childhood morbidity and care givers responses; barriers to accessing under-five child health services; and social determinants of child health in a slum setting.

6.4.1 Child health governance and institutional arrangements in an urban setting

The study revealed that the health governance and institutional arrangement of child health service delivery is similar to the nationwide health system arrangement. For instance at policy level, content of the child health and survival strategy which includes policy arrangements such as IMCI, EPI, ECD have been designed as a national standard where the contextual needs of urban settings or urban slum settings in particular have not been explicitly articulated. The lack of explicit attention to vulnerable urban population groups such as under-five children resident in slum conditions may understandably be due to dearth of sustained epidemiological, health service and economic research evidence illuminating the plight of urban slum residents. Indeed, nationally representative surveys such as Demographic and Health Surveys (DHS), Integrated Household Surveys (IHS), Multiple Indicator Cluster Surveys (MICS), while undertaking rural-urban and socioeconomic disaggregation of findings, have fallen short of providing evidence suggesting the health and socioeconomic disadvantage of the urban poor living in slum conditions.

Some authors have posited that the starting point for health equity, for instance, is an explicit indication of the health equity goal in national health policies and strategies (Gilson, 1989). Health policy content in Malawi has in recent decades, emphasised the need to pursue health equity in access to health services including child health (GOM 2011, GOM, 2004). It is therefore important that stakeholders in child health should take advantage of this interest and momentum to pursue improvements of child health and survival in urban slums.

Child health service delivery at implementation level of District Health Office (DHO) is similar to the nationwide arrangement despite differential context in that it captures both city and rural settings. The only exception is that the city council is involved in the delivery of child health services mostly through running under-five and antenatal clinics in selected urban settings. Considering the context of decentralisation, there is an opportunity for the DHO and City Council to explicitly indicate targeted focus on health of children in urban slums through their District Health Implementation Plans (DIP), District Development Plans (DDP) and City Development Strategy (CDS). In this way, even when national level may not have emphasised the health of children in slum conditions, the implementation level will be responding to their contextual challenges.

Moreover, KII participants from the DHO and City Council elucidated the demographic pressures on delivery of health services in Lilongwe city. Health facility data also attests to a disproportionate burden of morbidity to the disadvantage of residents in informal settlements. Additionally, the urban profiling exercise coordinated by UN-HABITAT and various city authorities in Malawi's cities including Lilongwe provides an opportunity to place the health of children in urban slums on the agenda. This urban profiling conducted in 2010-2012 acknowledged that increasingly the urban population is residing in informal settlements that face challenges in access to health, land, housing and other social services (UN-HABITAT, 2010).

Related to child health governance structures at national level, the study found that some established structures do not function optimally, are sometimes duplicative, and that there is a policy-practice gap. For instance, the high level inter-sectoral committees on child health and survival were reportedly not meeting as originally intended. Similarly, existence of some child health policy arrangements such as Community-IMCI were not clearly understood by health workers who participated in key informant interviews. In particular the fact that health workers at health facilities indicated knowledge of the facility based IMCI and not its community component suggests implementation challenges in harmonising the two components of the same strategy. The three components of IMCI (facility based, health systems strengthening, and community) were meant to complement each other and not as mutually exclusive strategies.

In their systematic review of qualitative studies on care seeking for pneumonia, malaria and diarrhoea in sub-Sahara Africa, Colvin et al. (2013) also noted that delivery of child health services may have emphasised on facility based IMCI and community based child health service delivery of Community Case Management (CCM) with little attention paid to household and community child care practices crucial to child health. Further efforts may be required from policy to practice to synchronise these strategies in order to optimise their benefits.

The qualitative findings also highlighted the need for integration of child health programmes. The availability of multiple project based initiatives such as IMCI, EPI, ARI/ETAT, Malaria control, child nutrition, while laudable in other aspects, poses challenges particularly at

implementation level. Duplication of activities, erosion of staff time due to attending to multiple programme requirements, resource allocation implications are among the challenges. Establishment of an integrated child health programme that embraces all these programmes, effectively minimising duplication and reducing on some management structures may prove to be efficient and effective. And in order not to lose the focus on the initial underlying significance for establishment of respective child health programmes, an integrated list of child health indicators encompassing key areas from respective programmatic elements can be developed and subsequently tracked. In essence the Malawi health system, in its implementation of a Sector Wide Approach should pursue integration in its subsystems such as child health.

6.4.2 Under-five childhood morbidity and care givers response in urban slum settings

The commonest causes of under-five childhood morbidity and mortality in the slum settings were cited by participants in FGDs and KII as; pneumonia, diarrhoea, malaria, coughing and flu. These findings are consistent with findings from the prospective cohort study design where fever, ARI, coughing and diarrhoea symptoms were noted to be highly prevalent. Fever is the principal clinical manifestation for malaria and as such the two local terms for fever (*kutentha thupi*) and malaria (*malungo*) are sometimes used synonymously.

Commonly cited responses to under-five childhood morbidity included: home management; care seeking from a health provider; and care seeking from elders or traditional health practitioners for some disease conditions. Similar to findings of the longitudinal study, care givers relied on local shops to purchase medicines for the sick child but also used left over medicines from previous hospital visits. The implications for this have been previously discussed in section 5.4.2.1.

In general, the fluid replacement concept of diarrhoea management through ORS was very well understood across study areas. Similarly, preparation of ORS and its alternate salt and sugar solution was done correctly, suggesting success of health promotion in this regard. However, the down side of home management of diarrhoea was that ORS was regarded as full treatment for all sorts of diarrhoea and in some cases even persistent diarrhoea was reportedly being continuously managed at home with ORS on the understanding that the child was going be given the same even when they go to the hospital. Indeed ORS represents

a simple highly cost effective intervention for diarrhoea (Jones et al., 2003) and the high usage and seemingly universal knowledge of its relevance in diarrhoea management among care givers in urban slums is encouraging. Nonetheless, health messages should still emphasise that the fluid replacement, especially in persistent diarrhoea management, need to be complemented with seeking care from a health provider. In this case complications of dehydration or treatment of diarrhoea associated with infective agents can be undertaken timely.

In addition, the limited focus on other equally important home management interventions recommended by IMCI such as continued and frequent breastfeeding, continued feeding and increased fluid intake suggest the need for greater emphasis on health education on these other interventions. Besides inappropriate use of antibiotics such as Flagyl, Bactrim and Amoxycyllin was also noted for diarrhoea management. This also requires efforts such as rigorous enforcement of legal provisions for distribution and sale of medicines, public health campaigns on discouraging irrational use of antibiotics, and promoting appropriate health care seeking practices for children.

Sponging the child with tepid or cold water and administration of antipyretics like Panadol was also cited as management of fever, generally reflecting good knowledge of fever management. Nevertheless, some inappropriate management of childhood fever was noted such as combination of two antipyretics such as Panadol and cafemol, higher dosages, and in some cases, use of antibiotics. A qualitative study in two rural districts in Malawi also found similar home management practices for children with febrile conditions (Chibwana et al., 2009).

While it is encouraging that most of the cited interventions are appropriate for fever, it is important that home management is not taken as a substitute for care seeking from a biomedical provider. In a sense, good home management of fever may itself be inappropriate response if a child is not taken to a health provider. Fever, such as that caused by malaria progresses very fast and can cause death within hours of onset in children (Greenwood et al., 1987). It follows that health workers, while promoting knowledge on home management as one way of reducing potential complications of fever if unchecked from an early stage, should emphasise on timely health care seeking. For malaria management, this is even more relevant

considering that unlike the previous antimalarial drug SP which was available over the counter, the currently recommended antimalarial Artemesinin-based Combination Treatment (ACT) is only accessible at health facility.

No specific home management practice was mentioned for ARI symptoms. This is positive because a child with ARI symptoms requires prompt treatment with antibiotics which would be appropriately delivered at a health facility level, as such there is no specific recommendation for home management of ARI symptoms. However, findings from the longitudinal study suggest that ARI morbidity was not associated with care seeking from a biomedical provider. This is a concern as it entails a lost opportunity for effective management of ARI.

The findings have generally posited that care givers make efforts to seek health care from a biomedical health provider albeit acknowledging numerous challenges encountered with the health system. There was consensus across FGDs and KII that most care givers seek care for their under-five children late, allowing up to three to four days to elapse from onset of childhood symptoms. This is consistent with findings of other studies in Malawi and elsewhere in the sub-Sahara African region (Chibwana et al., 2009, Getahun et al., 2011, Rutebemberwa et al., 2009) where prompt access to treatment for under-five childhood morbidity is problematic.

Socio-cultural beliefs regarding aetiology and manifestation of some childhood conditions influence health care seeking practices of care givers with respect to traditional medicine. This qualitative study found that some childhood disease conditions are believed not to be curable using biomedical health providers and hence care givers use traditional medicine. The findings of this study are in tandem with other studies that have demonstrated the use of traditional medicine for treatment of some childhood illnesses (Chibwana et al., 2009, Colvin et al., 2013). For instance, Chibwana et al., (2009) found that local beliefs that some childhood fevers were as a result of *mauka* (persistent child fever believed to be due to maternal vaginal warts) resulted in consulting traditional healers as a first resort. Similarly *mauka* were mentioned in this study as a condition for which traditional medicine is effective hence either elders or traditional healers are consulted, instead of biomedical health providers. Further

research is warranted to understand this phenomenon, the nature of traditional remedy provided and implications for child health.

6.4.3 Barriers to accessing under-five child health services.

This qualitative study revealed that there are both supply and demand side factors that deter access to under-five child health services. It is noteworthy that supply side factors were more predominantly discussed in KII and FGDs and mostly related to the public health system. The prominent reference to the public health system is unsurprising as it is the most utilised by the study population for reasons suggested earlier. The supply side (health system) barriers to accessing under-five child health services that emerged included: lack of medicines and other medical supplies, long waiting times, delayed opening times for health facilities, negative attitude of health workers, and unsatisfactory examination of the sick child.

Quantitative evidence particularly pertaining to relative significance of these factors in so far as they influence health care seeking decisions for under-five child health services is discussed in chapter 7 based on findings from the DCE study. However, the cumulative challenge of these health system factors has been cited in many studies as a consequence of weak health systems in sub-Sahara Africa. In particular these findings are consistent with findings of a systematic review of qualitative evidence which, in aggregate terms, postulated that care givers perceive provision of child health services in public health facilities as insufficient and ineffective; its staff mostly rude and uncaring (Colvin et al., 2011).

Lack of medicines and supplies represented one of the most recurrent factors cited as a barrier of access to under-five child health services. Indeed, various reports have indicated erratic availability of essential medicines and supplies over the years in the Malawi health system (GOM, 2011, GOM, 2009, GOM, 2004). For example, recently, a 60% stock out of antibiotics for community case management of childhood illnesses was reported (GOM, 2013). Besides inadequate health financing, various aspects reflecting weak logistics management and information systems have been posited to contribute to inadequacy of essential medicines and supplies at implementation level. These include: inability to use health information for quantification of medicines and other supplies at both implementation and policy levels; ineffective controls leading to pilferage and other forms of wastes; weak distribution systems; and improper planning to account for lengthy international

procurement processes (GOM, 2013). While recently, the Ministry of Health has undertaken reforms such as transformation of the Central Medical Stores (CMS) to an autonomous public trust including recapitalisation of CMS to ensure efficiency and effectiveness in its service delivery, the impact of these reforms may take long to materialise. It is therefore imperative that short to medium term initiatives are undertaken to deal with this challenge.

Related to unavailability of medicines and supplies, inappropriate examination and long waiting times emerged as two distinct but related health quality dimensions that are challenges to access of under-five child health services. This renders support to findings from a qualitative study in Zambia that found waiting times and nature of examination as critical care giver considerations determining access to under-five health services (Baume et al., 2000). Care givers often cited that health workers do not take time to listen to their explanations about the child's illness and often take the subjective history in a hurry and sometimes proceed with prescriptions without examining the child or they do so superficially.

Whilst this study did not undertake observation as a form of qualitative data collection to assess case management of respective children, it appears that health workers did not follow the steps for integrated case management of childhood illnesses as enshrined by the IMCI strategic approach. In a survey conducted in 2009 to assess implementation of health facility based IMCI in Malawi, it was found that performance on many indicators was below target. For example while IMCI recommends that assessment of the sick child should include checking presence of coughing, diarrhoea and fever, this was undertaken in only 54% of observed assessments, only 15% of health workers assessed for presence of child danger signs, only 15% checked for weight of the child against growth monitoring chart and only 50% checked immunisation status of the child (GOM, 2009). It is noteworthy that the results of this assessment were not significantly different from those of an earlier assessment conducted in 2004 (GOM, 2009). Furthermore, these results emerged from an assessment that used overt observational assessment as a data collection technique. The potential for overestimation due to the Hawthorne effect (Bowling, 2009) is therefore highly probable. On this basis it is logical to argue that in day to day delivery of under-five child health services, quality is further compromised and assertions of care givers in this qualitative study strongly point to this evidence.

Consequently, care givers in this qualitative inquiry mostly expressed dissatisfaction with services rendered to their under five children. This contrasts to findings of the health facility IMCI assessment in Malawi, which indicated that care givers were generally satisfied with the care received even when in most cases there were technical shortcomings by comparison with the gold standard of IMCI approach (GOM, 2009).

Undertaking a thorough examination of the sick child is often challenged by shortage of health workers who have the pressure to exhaust the long queues. Admittedly, a thorough examination requires more time per child which in the process entails longer waiting time for other care givers on the queue. Health workers have provided this challenge as the main reason for suboptimal assessment of the sick child. Nonetheless, it is imperative that management of a sick child is not compromised as it has direct implications on the health of the child. Moreover, other studies have demonstrated that a thorough examination is a highly valued dimension of child health care quality (Mangham et al., 2005) and as DCE results of this PhD research will demonstrate, care givers are willing to wait if their child is likely to receive a thorough examination (see chapter 7).

Long waiting times were noted as discouraging factors to access under-five child health services especially in public health facilities. This is consistent with a study in Zambia where care givers for febrile children indicated that waiting for long times discouraged their use of health facility and further expressed they could have opted for home management (Baume et al., 2000). Understandably, the basis for this consideration relates to the fact that longer waiting times at a health facility imply foregoing numerous other activities such as caring for other children, household chores, and potential loss of income from business or casual work, among others.

Negative attitude of health workers in form of verbal expression, favouritism, and unsympathetic actions represented a theme of recurrence in this qualitative inquiry. This was noted as a significant barrier to access of under-five child health services as care givers mentioned that some remarks are dehumanising and hence discouraging. For instance this expression from an FGD: *"We get insulted and you may think like you have been cursed"* portrays the magnitude of the problem and its potential impact on subsequent health care seeking. In Malawi, media reports on some negative attitudes of health workers have been

reported affirming the existence of the problem on a broader level. Similar findings have been reported elsewhere in sub-Sahara Africa with some authors effectively calling for the need for better engagement between health workers and care givers (Colvin et al, 2013). Unmasking specific reasons contributing to such challenges is problematic and was beyond the scope of this study. However, other discourse and anecdotal assertions cite the following reasons: psychological pressures of the work environment on health workers including too much work with limited resources; lack of interpersonal skills by health workers; weak regulation of professional behaviour; limited supervision of health workers, and overall demotivation by health workers and lack of incentives.

Related to health worker motivation, it has been shown that a motivated health workforce provides quality health care (WHO, 2007). In Uganda, incentives to health workers in provision of maternal health services reportedly improved quality of health care, particularly interpersonal relationships between women and health workers (Kiracho-Ekirapa, 2013). It follows that in order to improve this aspect of health service delivery, various aspects may need to be considered ranging from regulation of health professionals, developing skills of health workers in rapport building, instituting supervision and incentive schemes at implementation levels, and strengthening health governance arrangements at local level that support conducive health worker-care giver relationship environment. From the PhD researcher's knowledge of the context, health governance structures at local health facility levels such as hospital ombudsman, complaints and disciplinary committees are either non-existent or dysfunctional despite being provided for in policy in Malawi. Ensuring the functional status of such structures may be the starting point to improving the health system environment on the psychological aspect for care givers in the process of their interactions with the health system.

This study noted that cost of health care was an important barrier to accessing under-five child health services. Evidently, it was noted that care givers from Ntandire mostly preferred utilising a public to a private health facility despite being in proximity to the latter. Furthermore, lack of money to pay for the cost of health care was the commonest reason cited for use of public health facilities which provide free health care at the point of use, despite multiple concerns pertaining to quality of care provided to their under-five children. These findings confirm those from various previous studies in different contexts that have

demonstrated that cost of health care remains a significant barrier to access of health services (Baume et al., 2000, Hildenwall et al., 2007, Jacobs and Price, 2004, Lagarde et al., 2012, Malama et al., 2002). With particular reference to urban slum residents, the Knowledge Network on Urban Settings (KNUS) posits that cost of health care is a more prominent consideration than proximity to health services among the urban poor such as those residing in slums (KNUS, 2008).

It is noteworthy that care givers encounter various indirect costs such as transportation, food, including additional direct costs such as purchase of medicines from private pharmacies in the context of lack of medicines in many health facilities. Evidence is abound that these indirect costs are a significant proportion of the total cost associated with an illness (Mustafa and Barbiker, 2007, Powell-Jackson et al., 2012, Rutherford et al., 2010, Thaddeus and Maine, 1994). Similarly there is evidence that in search of quality health care, urban slum residents may seek care from private health facilities (KNUS, 2008). Even when the use of private health facilities is very minimal in this study, the risk of catastrophic expenditure on health is present for urban slum residents as repeated child morbidities require continued expenditure on indirect and direct costs.

6.4.4 Household and community child care practices and their implications on child health

Other key household and community child care practices explored in this qualitative study included breastfeeding, and care of the umbilical cord. The findings indicate that in general, care givers have a good understanding of the appropriate time to initiate breast feeding, the concept of exclusive breast feeding and the health benefits of breast feeding. The reported practices however were mixed with regard to exclusive breast feeding. It appears the majority of care givers exclusively breast feed for four months and others start complementary feeding even earlier than four months. The WHO recommends exclusive breast feeding for the first six months and gradual introduction of solid foods to complement breastfeeding (WHO, 2010).

On this basis, it can generally be argued that there is a positive indication from the breast feeding practices noted in these urban slum settings. There is extensive evidence that breast feeding, particularly exclusive breast feeding in the first four to six months and effective

complementary feeding thereafter is protective against pneumonia and diarrhoea (Jones et al., 2003) hence addressing two of the commonest causes of childhood morbidity and mortality in Malawi and globally. More prominently, Jones et al (2003) argued that with optimal coverage of breast feeding, 13% of child deaths in 2000 could have been averted. In Malawi, exclusive breast feeding rates are high for children under 3 months (93% and 82% for children aged 0-1 and 2-3 months respectively) but decline to only about 40% for children aged 4-5 months (NSO and IFC Macro, 2011). Based on qualitative description from this study, breast feeding rates in urban slum settings may be following this trend.

With regard to care of the umbilical stump after delivery, both good and risky practices were noted. For instance, application of *nsitu (*solid particles of smoke from the roof of the kitchen), *musi* (solid dirt scrapped from pestle) and foecal material of mice present significant risk for neonatal tetanus, sepsis and other infections to the child. In this regard therefore health education is warranted on the risk such practices pose to child health.

6.4.5 Social determinants of child health in an urban setting

The findings of this qualitative inquiry point to existence of multiple social determinants of child health in an urban slum setting. As expected, inadequate sanitation, unreliable supply of clean water, poor housing structures, overcrowding, poverty, poor refuse disposal were all noted. The risk that this context poses to the health of population, particularly children as a vulnerable population group have been extensively documented (Vlahov and Galea, 2002, CSDH, 2008, KNUS, 2008). In particular, the WHO's Commission on Social Determinants of Health (CSDH) has generated robust evidence on various social determinants of health and health inequities. Furthermore, it has boldly argued for commitment in addressing these social determinants, termed *'the causes of the causes'* in order to improve population health and reduce health inequities across various social groups (CSDH, 2008, Marmort, 2006).

Households as many as six use a single pit latrine and in most cases these pit latrines are made of weak structures or sometimes from sack materials. Worse still, there were reports of pit latrines falling down during the rainy season further compounding the inadequacy of sanitation. These pit latrines were also close to houses. Care givers recognised the risk inadequate sanitation poses to child health and mentioned them as risk factors for childhood diarrhoea morbidity. However they indicated that there was little they could do considering

the space limitations and that most of them live in rented houses and had to do with what the landlord had provided.

Environmental contamination was also evident and poses significant risk to health of the slum population and for children in particular. This results from multiple factors such as poor drainage system, lack of refuse disposal pits and inability by the City Council to collect refuse. For instance accumulation of stagnant water poses significant risk for malaria as it creates a good medium for breeding of malaria causing mosquitos. These findings are corroborated by a rare media feature on slums that appeared in a local newspaper in Malawi. After visiting Ntandire under a media sensitisation tour by an NGO working in this slum, the author noted as follows:

> *"Rose Robert is only 20 but she already has three children. Uneducated and without skills, she depends on her husband who sells chicken parts for a living. She sits and right next to her is a toilet and her dump site. Her bathroom is a shack of strewn paper only cordoning off her would-be onlookers. The water that flows from her bath is channelled to a pit that doubles as a refuse pit"* The Nation Newspaper, October 14, 2012 Voices from the slum.

Whilst it is a positive feature that care givers recognised that this environment put their children at risk of diseases like malaria, it presents a situation for which they seem to have minimal control. Efforts to improve the physical environment have either been deficient or completely non-existent. A Non-Governmental Organisation that was operating in an area to improve sanitation through distribution of toilet slabs ceased its project in Ntandire and sustainability of using the technology it set up are questionable due to widespread poverty.

Structural deficits of houses and overcrowding were also cited as risk factors in this qualitative study. Indeed overcrowding, smoke exposure resulting from use of poorly ventilated kitchens predispose children to ARI (KNUS, 2008). Overcrowding in this case pertains to both many people living in a single small house and a high population density. Moreover an urban profiling exercise undertaken in Lilongwe attests to this as it reported that 71% of the Lilongwe population resides in informal settlements that cover only 12% of the total land area (GOM, 2010). This seemingly paradoxical scenario sums up the plight of urban slum residents and their children with regard to housing.

The Lilongwe City Assembly undertook a Lilongwe urban profiling exercise. Furthermore, in collaboration with urban slum communities and an NGO, they profiled each of the urban slums in Lilongwe focussing on the following key areas: sanitation, water, refuse disposal, land tenure, housing, health, infrastructure, and socioeconomic indicators (GOM, 2010, CCODE, 2010, CCODE, 2010). Consequently a Slum Upgrading Programme document has been developed even though implementation is slow. The effectiveness of such a programme is yet to be assessed in Malawi. Evidence from elsewhere has demonstrated the complexity of implementing and evaluating slum upgrading programmes (Turley et al., 2013). This notwithstanding, a systematic review of evidence of effectiveness of slum upgrading programme focussing on improving the physical environment found mixed evidence. In the review some studies noted positive effects on health indicators such as reduction in water borne diseases while others did not find any significant positive effect on various health indicators such as no reduction in infant mortality (Turley et al., 2013). The components of the slum upgrading programmes for Malawi is similar to those implemented elsewhere (Turley et al., 2013, UN-HABITAT, 2010). Whilst cognisant of the contextual differences, there is potential that implementation of this programme will give rise to the benefits experienced elsewhere. However, in view of the complexity of implementing such broad interventions, it is important that effective monitoring and evaluation systems should be in place so as to inform the implementation process of such complex interventions.

Furthermore, evidence suggests that inter-sectoral collaboration is key to success of such programmes. For instance the CSDH effectively posits that inter-sectoral action is essential in tackling social determinants of health and health inequities (CSDH, 2008). In a sense slum upgrading programmes involve improvements in various facets of the urban slum environment which fall within different sector realms, rendering inter-sectoral and intra-sectoral collaboration a prerequisite for effective implementation. This element of inter-sectoral coordination appears to be lacking in Malawi, especially with regard to slum health. The lack of involvement of health authorities in the urban slum profiling exercise to draw implications for health attests to this. Consequently, the health component of the urban profile has focussed on distribution of health facilities with little recognition of areas such as: the epidemiological profile, implications of the urban environment on population health, and a robust assessment on the distribution and implications of social determinants of health on

children residing in urban slums. Moreover, as demonstrated in this study, the sub-optimal functional status of inter-sectoral committees under the institutional implementation arrangement of the Accelerating Child Survival and Development (ACSD) strategy and non-existence of inter-sectoral collaboration at implementation level is evidence of this inadequacy.

The overarching implication of the findings of this study on social determinants of child health in urban slum settings is therefore to effectively institute inter-sectoral linkages and address the social determinants of child health. Weak inter-sectoral collaboration has previously been cited as one of the main challenges in implementation of child health and survival efforts and pursuits of the MDG 4 (GOM, 2008). It is therefore imperative that inter-sectoral action transcends policy rhetoric, it should be evident in practice to have impact.

Social determinants of health fall within the external environment of the Andersen health utilisation framework and affect the predisposition to child health services, their enabling and need factors. In a way, the Healthy Cities and subsequent Healthy Settings movements promoted by the WHO in the mid-1980s have promoted the need for inter-sectoral linkages to address determinants of urban health (WHO, 2005). Despite adopting the philosophy of the policy, Malawi has been slow to embrace it. This call remains relevant in the present day urban Malawi with an increasing rate of urbanisation and its corresponding changes impacting on the health of under-five children. A recent policy objective of *"reducing risk factors to health",* its corresponding strategies of advocating for health in all public policies and plans to establish the national commission on social determinants of health, are all steps in the right direction. It is important that these transcend mere policy content.

6.5 Strengths and limitations of the qualitative study design

6.5.1 Strengths of the qualitative study

The use of 8 FGDs involving as many as 89 care givers and 10 participants in key informant interviews, from whom data was obtained to saturation point represents a strength regarding the depth and wealth of information. This allowed for intense exploration of the phenomena as evidenced by wealth of information from various qualitative data transcripts.

This study used a rigorous method of analysing data that allowed immersion in the data to draw meaningful conclusions. The active involvement of the primary researcher at all stages

of qualitative inquiry is a particular advantage on immersion into the data. The double coding and use of the inter-coder reliability helped to minimise bias, ultimately enhancing the validity of the study findings.

6.5.2 Limitations of this qualitative study

Three limitations arise in this study. First, the richness of qualitative findings could have benefitted from undertaking some FGDs based on preliminary findings of longitudinal study. This could have allowed exploration of further information that could more solidly explain some quantitative findings which at present may lack explanation from the overall study. While in retrospect this represents the ideal, time constraints affected its implementation.

Secondly, the scope of the study findings could have benefited from inclusion of other key informants. Officers involved in urban planning such as those from the City Council and a high level key informant representation such as director at Ministry of Health are cases in point. Inclusion of the former was not originally conceived but the depth of information from a key informant from UN-HABITAT arguably covered much of the perspectives potentially available from City Council. As for the latter, attempts were made but convenience of time on the part of the potential informant, was problematic to afford an interview. Nonetheless, as Patton, (1990) argues, trade-offs between scope and depth are not uncommon in qualitative inquiry.

Thirdly, the general limitation of qualitative studies relating to difficulty of generalising the findings also relate to this study. It is argued that the use of non-representative samples which is common in sampling of qualitative study participants limits generalisation of findings and application in other contexts (Patton, 1990). Nevertheless, in this PhD research, this limitation should be considered in the context that a mixed methods approach was utilised, effectively allowing for strengths of some designs to compensate for limitations of another.

6.6 Summary and conclusion

To summarise, this qualitative study has found that care givers generally have positive impressions about seeking care from a biomedical health provider in the event of childhood illness. However care is usually sought late as they first try with home management or watchfully wait. Public health facilities are mostly utilised but care givers have major concerns that act as barriers to use of under-five child health services. These barriers include: lack of medicines and supplies, negative attitude of health workers, long waiting times,

unsatisfactory health examination of the child, delayed opening times, and socio-cultural beliefs. Various social determinants of child health and health care seeking in an urban slum setting have been noted, key among them include: poverty, water and sanitation, socio-cultural child care practices, and urban health governance.

In conclusion, this study has shown that increasing access to under-five child health services and promoting child health and survival requires addressing multiple factors at household, community, health system and the broader socioeconomic environment. Future strategies should therefore focus on intensifying health education on importance of timely care seeking, harmonising effective home management and timely health facility use, and clarifying misconceptions about inability of the biomedical health system to cure some childhood morbidities. Additional strategies should include strengthening the health system to effectively respond to care givers expectations. More importantly, there is need for inter-sectoral collaboration to address social determinants of health care seeking and health of under-five children in urban slum settings.

CHAPTER 7

RELATIVE IMPORTANCE OF HEALTH SYSTEM FACTORS INFLUENCING CARE SEEKING DECISIONS: ELICITATION FROM A DISCRETE CHOICE EXPERIMENT

7.1 Introduction

A Discrete Choice Experiment (DCE) was used in this PhD research to determine the relative significance of health system factors in influencing care seeking decisions for under-five child health services (objective 5). This chapter presents the methodological considerations, results, discussion of findings, strengths and limitations of the DCE study design.

7.2 Methodology

7.2.1 Discrete Choice Experiment (DCE) design considerations

A DCE provides a rigorous methodological basis for eliciting people's stated preferences for a good, service or product in hypothetical scenarios (Pokhrel, 2006, Mangham et al., 2009). Its theoretical basis is the random utility theory which relies on the economic rationality and utility maximisation (Ryan et al., 2008). The theory argues that an individual chooses an alternative that achieves his/her highest individual benefit, known as utility. And that the utility of an alternative is associated with the utilities of its composing attributes (Ryan et al., 2008). For example, in the case of a binary choice between two hospitals, an individual has

$$Prob[Y_k = 1|X_i] = Prob[U_{Hosp\,k} > U_{Hosp\,j}]$$

Where Y_k is the choice variable and equals 1 when Hospital k is chosen, and where U_{ik}; the utility of individual i for hospital k is assumed to be a function of the n attributes of the hospital, as expressed below:

$$U_{Hosp\,k} = \beta + \beta_1 X_{1k} + \beta_2 X_{2k} + \ldots + \beta_n X_{nk}$$

Precisely, the total value of a good/service is the sum of its parts hence DCEs separate goods/services into separate parts and value characteristics separately (Pokhrel, 2006).

Discrete Choice Experiments belong to a paradigm of stated preferences in economics literature. There are essentially two paradigms in this regard namely: revealed preference and stated preference. Revealed preferences entail exploring an individual's preferences as

revealed through their actions in the market, especially with regard to their value of interest. Stated preferences, on the other hand, elicit individual preferences by asking them to make choices in virtual (hypothetical markets) (Pokhrel, 2006). Two commonly used stated preference techniques include Contingent Valuation Method (CVM) and DCE. The CVM provides for valuation of a service / intervention either directly or relative to other interventions and derives willingness to pay (WTP) measures which imply the value attached to the specific interventions (Pokhrel, 2006).

The DCE entails asking individuals to make a choice from hypothetical scenarios, each of them with defined characteristics, effectively allowing researchers to uncover how individuals value different attributes of a service, programme or good (Mangham et al., 2009, Lancsar and Louviere, 2008, Ryan et al., 2008). For example an individual's preference of a hospital is dependent on the expected total value of hospital service characteristics which may include: availability of drugs; waiting time; staff attitude and nature of health examination (Hanson et al., 2005).

Precisely *"a DCE is a rigorous method of eliciting individuals' preferences in that it allows estimation of the relative importance of different aspects of care, the trade-offs"* (Pokhrel, 2006; p3). Additionally, a DCE has an advantage of mimicking a real life scenario of decision making where an individual is faced with a choice from two or more services with varying characteristics and has to make trade-offs in the course of decision making.

This contrasts with other potential techniques to achieve the objective of denoting relative significance of health system factors in care seeking decisions. For example, a ranking technique in a quantitative questionnaire or in qualitative investigation could have been used. However these approaches could elicit responses where care givers' decisions could have been based on only single attributes (e.g. waiting time vs. examination vs. availability of drugs). In this arrangement, service attributes are normally devoid of attribute levels and a combination of attributes between two differing services. Consequently the real life trade-offs that people make in care seeking decisions in their day to day lives is non-existent.

Having defined the question and decided on the DCE, designing the DCE involved following five key steps. These steps included: establishing health system attributes; definition of

attribute levels; selecting an experimental design and constructing choice sets; and experimental context and questionnaire development. The subsequent section describes the process undertaken in this DCE design.

7.2.1.1 Establishing attributes of under-five child health services

In DCE, attributes entail the characteristics of a service on which preference decisions are made. Identifying attributes is a key first step of the DCE as the attributes and their levels provide hypothetical scenarios from which individuals choose (Mangham et al., 2009). In essence, the validity of a DCE study is dependent on correctly specifying the attributes and their levels (Mangham et al., 2009, Ryan et al., 2008).

While acknowledging the dearth of guidance on how to establish attributes and assign attribute levels in DCE literature (Coast and Horrocks, 2007), there is apparent consensus in DCE discourse that identification of attributes and level definition can be solicited from literature and qualitative inquiry (Coast and Horrocks, 2007, Lancsar and Louviere, 2008, Ryan et al., 2008). In particular, Mangham et al. (2009), based on their experiences in conducting DCEs in developing country settings, have emphasised the importance of qualitative enquiry such as using Focus Group Discussions (FGDs); review of grey literature and local contextual knowledge in eliciting credible attributes and levels for a DCE study. Likewise, in this PhD research, attributes were identified through a combination of literature search, findings from the longitudinal and qualitative studies which preceded this DCE study, and the author's knowledge of the local context.

In FGDs conducted with care givers, the following characteristics were cited as critical in their decisions to seek care for their under-five children: waiting time; availability of medicines; thorough examination; health worker to have time to listen to care givers explanations; attitude of health workers; opening hours of the health facility; distance to health facility; and essential supplies to diagnose a child (Refer to chapter 6). Literature review from other studies, some of which were DCEs found some similar findings as demonstrated in the literature review section (chapter 3) of this PhD thesis.

Consequently, six main health system attributes were chosen as important to care givers in their decision making to use a health facility in the event of childhood illness. They include: distance to health facility; availability of medicines; waiting time; attitude of health worker,

nature of examination; and cost of health care. As it may be noticed, some attributes that emerged from both literature review and qualitative inquiry have not been included in the attributes and levels for this DCE study. The main reasons for non-inclusion include: that they had a relatively inferior ranking in importance as denoted from FGDs; there is conceptual overlap with other attributes, e.g. availability of medicines and supplies versus availability of diagnostic services; staff dedication versus attitude of health workers; and health worker to take time to listen and examine the child versus thorough examination of the child. As Mangham et al. (2009) elucidate, it is important to be cautious of inter-attribute correlation at design stage as this may compromise design efficiency and create confusion to respondents

It was the researcher's opinion that six attributes would be manageable to study respondents. Most DCE studies have used less than ten attributes so as to minimise or eliminate cognitive burden on the respondents and prevent the potential compromise on respondent efficiency. As Mangham et al. (2009) postulate, having too many attributes may lead to respondents making decision heuristics such as basing on a single or a subset of attributes and not the entire set of attributes as required to effectively make trade-offs.

7.2.1.2 Assigning attribute levels

Assigning attribute levels reflects another critical step of DCE design process and it is intertwined with identification of attributes. At this stage it is important to ensure that attribute levels are realistic and meaningful as this increases the precision of the parameter estimates (Mangham et al., 2009). In this study, definition of attribute levels predominantly emerged from qualitative inquiry and the PhD researcher's understanding of contextual factors. Care givers during FGDs explained the status quo in terms of provision of child health services at facility level and in many cases defined what they believed to be optimal care. For example, participants in FGDs indicated phenomena where sometimes they go to the health facility's dispensary and do not find the medicines their child has been prescribed. Conversely they cited availability of medicine as important to them and definitive of a health facility they would choose to take their sick child to.

Some attribute levels, in particular cost of health care and distance to the health facility, were informed by preliminary findings of baseline data in the longitudinal study. Some questions at baseline related to how much care givers paid in accessing child health services in cases

where they paid; and how long it took to walk to the frequently utilised health facility. Table 7.1 illustrates health system attributes, attribute levels, attribute definition, and codes as used in this DCE.

Table 7.1: Attributes, levels and definitions as used in the DCE study

	Attribute	Attribute level	Codes	Description
1	Distance to health facility	Half an hour	30	Distance as measured by the time it takes to walk to the facility in minutes
		1 hour	60	
		1 and half hours	90	
2	Availability of medicines and supplies	Medicines and medical equipment not available	0	Entails whether appropriate medicines and supplies for treatment of the child are available or not
		Medicines and medical equipment always available	1	
3	Waiting time	2 hours	2	Relates to waiting from time of arrival at health facility to completion of all treatment services required and going home
		3 and half hours	3.5	
		5 hours	5	
4	Attitude of health worker	Health workers do not treat with respect, do not listen carefully when client is explaining	0	Entails whether attitude of health worker attending to care giver is friendly and respectful or is rude
		Health workers are friendly and treat with respect, listen carefully when client is explaining.	1	
5	Nature of examination	Child not examined, health worker just writes as I explain and prescribes medication as I finish	0	Refers to how the child is examined by the health worker
		Superficial examination	1	
		Child examined thoroughly	2	
6	Cost of health care	Free	0	Relates of costs of health care at the facility
		K 600	600	
		K1700	1700	

Note: attribute codes were used in analysis and will be explicitly noted during the test of respondent consistency in making DCE choices

7.2.1.3 Experimental design and construction of choice sets

Experimental design in DCE entails generating a combination of choice sets from which respondents choose but also arranging them in a statistically efficient way in order to ensure reliable parameter estimates (Ryan et al., 2008). It includes various facets in the design process such as; choice of design; approaches used to construct experimental design; and arrangement of choice sets. Subsequent sections will briefly highlight study design considerations in these areas.

One of the key DCE design considerations relates to a decision whether to use a full factorial design or a fractional factorial design. A full factorial design contains all possible combinations of the attribute levels, would provide the most efficient design and guarantee reliable estimation of parameters (Lancsar and Louviere, 2008, Ryan et al., 2008). To determine the number of possible combinations in a full factorial design, is given by the product of the number of levels (L) for each attribute (A); L^A (Ryan et al., 2008).

Considering that this study has 4 attributes at 3 levels and 2 attributes at 2 levels, a full factorial design would entail 3^4x2^2 resulting in 324 possible combinations of attribute levels. While, a full factorial design would be the most efficient, it is recognised that its usage is prohibitive mainly for two reasons. Firstly, it tends to have large combinations which would be a cognitive burden to respondents to consider all the scenarios and make choices (as would be the case for 324 combinations in this study), hence unmanageable. Secondly, it would be too expensive as it would entail more field days to exhaust sample size, bulky questionnaires that require lots of stationery and printing, among others, to the extent that it is mostly financially inefficient to undertake (Blaauw, 2005, Ryan, 2012).

For this reason, a subset of a full factorial design, termed a fractional factorial design is used for this study. In a fractional factorial experimental design, choice scenarios are reduced (from a full factorial design) to manageable numbers in a statistically efficient way, usually by statistical software. Many DCE studies have used fractional factorial as opposed to full factorial designs. For example a review of DCE studies by Ryan and Gerard (2003) found that 74% of the studies used fractional factorial designs. A more recent review of DCEs conducted between 2001 and 2008 noted a 100% usage of fractional factorial designs (de Bekker-Grob

et al., 2012) affirming its practical appropriateness. However, it is imperative that design efficiency is ensured.

An integral part to DCE experimental design to ensure design efficiency is the decision relating to which approach to use in generating a fractional factorial design. Various design approaches exist among them being: orthogonal, D optimal designs, L^{MA} designs (Debora et al., 2008). The choice of which approach to use depends on the question being addressed and other considerations such as whether the study is estimating main effects only or both main effects and interactions. While orthogonal designs have been predominantly used in early DCEs, D-optimal designs are increasingly being used recently and are said to attain high level efficiency (de Bekker-Grob et al., 2012, Debora et al., 2008, Ryan et al., 2008). In order to achieve the underlying question of this DCE, main effects only were estimated and a non-linear relationship between and among attributes was assumed in the design.

Another important consideration in the DCE design relates to whether to present choice alternatives in a generic (also referred to as unlabelled) or alternative specific format (also referred to as labelled). To illustrate, in a generic format, the combination of attributes and levels are presented as choice alternatives that do not relate to identifiable entities, such as hospital A versus hospital B. In alternative specific format, the attributes and their levels are presented in choice alternatives that are labelled with familiar context such as public hospital versus private hospital (Ryan, 2012, Ryan et al., 2008). The label of alternatives in this case acts as an extra attribute even though it is one which remains constant in all choice sets.

This study used a generic design. In an alternative based choice format, while the cognitive burden to the respondent is reduced due to familiarity with the context, the choice focus may mainly be on the labelled alternatives than on the attribute trade-offs. The labelled alternative format is thus more appropriate when the emphasis is on valuation of the labelled alternatives. A generic (unlabelled) choice format on the other hand has the advantage of the respondent focussing on the attributes effectively making it more desirable in situations where the emphasis is on marginal rates of substitution between attributes (Ryan et al., 2008) hence more suited for the DCE basis of this study.

Software packages available for use in DCE experimental design include: SAS, SPSS, SPEED, ENGEN, LIMDEP, SAWTOOTH. In addition, websites and design catalogues are also available

for use (Blaauw, 2005, Debora et al., 2008, de Bekker-Grob et al., 2012, Ryan et al., 2008). This study used D optimal experimental designs generated by SAS statistical software. Ryan et al. (2008) posit that D optimal designs have the ability to generate highly efficient fractional factorial designs.

The output from SAS produced eleven design sizes of which sizes 76 and 36 were the most efficient at 100% D-efficiency and the design was saturated at size 11. A design size 18 was chosen with one violation and a 99.9% D-efficiency. It was decided to use 9 choice sets hence these choice sets were generated from the 18 profiles of the experimental design. The basis for the choice was consideration of cognitive burden (Ryan et al., 2008, Kruk et al., 2010) especially in view of low education levels of study participants as noted from the longitudinal study.

This DCE used two alternatives per choice set thereby using a forced choice set up of the questionnaire. The decision whether to have a forced choice set up or have an opt-out option in choice sets is of paramount importance in designing DCE (Ryan, 2012). A forced choice option entails that a respondent is given a choice between two or more options with no possibility of opting out by choosing neither of the available options. An opt-out set up on the other hand entails that a respondent is given another option to choose neither of the available alternatives. Ryan et al. (2008) posit that a forced choice may overestimate participation as some individuals are forced to make a choice when the realistic situation may have been not choosing any of the options available as is practically the case in health care where individuals may choose not to take up certain services. On the other hand, they argue that providing for an opt-out option raises issues of how to account for non-participation during the data analysis phase. As Marshal (2012) illustrates this decision relates to an issue of trade-offs between statistical efficiency and respondent efficiency where some decisions mimic the real world situation better leading to respondent efficiency while posing difficulties during statistical analysis.

Some studies have used forced choice, such as Hanson et al. (2005); Blaauw and Schierhout (2006) in (Blaauw, 2005) and Biesma et al. (2007) while others, such as Kruk et al., (2009), Kruk et al., (2010) have included a neither option. An attempt was made to counter the main concern relating to potential overestimation resulting from using a forced choice. During a

DCE pilot study, an additional question was included to check if respondents could have opted to choose neither of the options in each of the choice sets. This happened in only about 1% of all choice sets available hence the confidence to maintain a forced choice set up. Moreover in explanations prior to presenting choice sets, care givers were requested to imagine that their child had an illness condition for which health care needed to be sought. This potentially limited options of choosing not to seek health care

7.2.2 Sample size

The study sample size for this DCE included 338 participants who were randomly selected from participants available during the t2 follow up. In DCE, each individual provides multiple observations as each choice set has two or more alternatives that are treated as independent observations (Biesma et al., 2007). The number of observations in a data set are determined by the number of respondents; the number of choice sets; and the number of alternatives in a choice set (Ryan et al., 2008).

Consequently, in this DCE design with a binary choice outcome and nine choice sets, each respondent provides 18 observations (2x9). The entire sample of 338 therefore provides 6084 (18x338) observations. Moreover, Bridges et al. (2011) noted that the majority of DCEs in health have used an average sample size of 150 participants. On this basis, a sample size of 338 was considered adequate for the study purpose.

7.2.3 Sampling frame and participant recruitment process

Participants in the DCE were drawn from a database of participants for the longitudinal study who had provided data at t2 (442 in total). A random selection of 350 out of the 442 available identification codes for participants at t2 was undertaken using Microsoft Excel. A total of 340 of the 350 randomly selected participants were requested to participate in the DCE. A total of 338, representing 99.4% consented and responded to the DCE questionnaire. The two who did not consent only indicated that they were not interested.

7.2.4 Data collection instruments and methods

Data collection for this DCE study (see Appendix IX) constituted nine generic binary choice sets generated from 18 profiles as per SAS fractional factorial design generation; plus two other choice sets added by the primary researcher as holdouts resulting in a total of eleven choice sets. The hold out choice sets were included for purposes of testing the consistency of

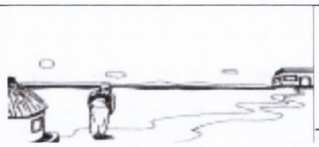
respondents' choices (preferences) which indicate respondent efficiency and validity of DCE results. Test of consistency results are presented in section 7.3.3. As indicated earlier, due to the cognitive demand of undertaking choices in DCE tools, careful consideration should be given to the number of choice sets that respondents are asked to complete. Generally, 8 to 16 choice sets are considered to be optimal, before respondent fatigue sets in (Biesma et al., 2007, Ryan et al., 2008).

This realisation is more relevant for this study as a majority of respondents have low education levels and they have not had experience of responding to DCE questionnaires. In efforts to increase respondent efficiency in this study, pictograms were used to describe choice sets, hence aided comprehension. Moreover, it has been argued that with the addition of graphic representations of attribute levels, DCEs have been shown to be feasible for use in populations with low literacy. Indeed studies in Ethiopia (Kruk et al., 2010); South Africa (Blaauw, 2005) and Tanzania (Kruk et al., 2009) have used pictograms in DCE studies to good effect as they have reported good predictive ability of the findings.

Admittedly, during pilot of the DCE component of this study, respondents qualitatively indicated that the pictograms aided their comprehension of the choice tasks. The pictograms were designed by a professional artist upon instruction of the attributes and their levels. Figure 7.1 is an example of pictogram presentation of choice set 1. All the 11 choice sets were presented in a pictogram format to respondents during data collection. Prior to care givers undertaking choice tasks, detailed explanation of each attribute and its levels was provided using a pictorial illustration (see Appendix X) for purposes of familiarising them with attribute illustrations. The DCE tool also included some background questions such as age of care giver, occupation, and household income.

Data for the DCE was collected by data collectors trained by the PhD researcher. Face-to-face interviews were conducted with care givers in their homes. It typically took approximately 45 minutes for participants to complete a DCE questionnaire. Since the respondents were randomly selected from those available at t2 of the longitudinal study, the same participant code numbers were used.

Figure 7.1: Pictorial illustration of DCE choice set

	Health facility 1	Health facility 2
Distance to health facility	 This entails that it will take you 1 hour (60minutes) to walk from your home to the health facility to access health care for your child	 This entails that it will take you 1 and half hours (90minutes) to walk from your home to the health facility to access health care for your child
Availability of medicine	 Medicines and medical supplies required to treat your child are always available at the health facility	 Medicines and medical supplies required to treat your child are not available at the health facility
Waiting time	 You will wait for three and half hours (210 min) from the time you come to the facility to receiving all your child's treatment and ready to go home	 You will wait for five hours (300 min) from the time you come to the facility to receiving all your child's treatment and ready to go home
Attitude of HW	 Health worker does not treat you with respect. He is seemingly angry	 Health worker is friendly and treats with respect
Nature of examination	 Your child is examined thoroughly by a health worker	 Your child is examined thoroughly by a health worker
Total cost	You are not going to pay anything. Health services are free to you.	 You will pay K1700 for all hospital costs

Which of the two hospitals would you choose *(Tick)*	Health facility 1 ☐	Health facility 2 ☐	

7.2.5 Analysis of Discrete Choice Experiment data

Data for DCE was entered in SPSS version 20 and later converted to STATA format. Data was analysed in STATA corp version 12.1. Within the choice set, the chosen alternative was entered using a code of 1 and the one not chosen was entered using a code of 0. Among independent variables (attributes), cost, waiting time and distance were modelled as continuous variables whereas attitude of health workers, nature of examination and availability of medicines were modelled as categorical variables and coded as indicated in table 7.1.

The model estimation assumed main effects only. A split sample was used in undertaking sub-group analysis of slum residence, household income, care givers' education and age in estimating relative importance of attributes of a health system. A random effects logit regression model was used for utility estimation. The deterministic utility model estimation was specified as below:

$$V_{Hospi} = \beta_{0i} + \beta_{1i} medicines + \beta_{2i} examination + \beta_{3i} attitude_{HW} + \beta_{4i} cost + \beta_{5i} distance + \beta_{6i} wait_{time}$$

7.2.6 Pilot study and other measures to ensure reliability and validity of the Discrete Choice Experiment

Data collectors for the DCE were the same that collected data for the longitudinal study. They underwent a two days training session which covered the following content: basic DCE methodology; interview techniques for the DCE choice tasks; and the content of the DCE questionnaire.

A pilot study for the DCE was undertaken in Mgona where 30 care givers participated. The care givers who participated in the pilot studies were not eligible to participate in the main DCE study. During the pilot, after every choice task, respondents were asked if they could have opted for neither of the health facilities available in the choice option. Only in approximately 1%, respondents indicated opting for a neither option hence confidence in health system attributes in the choice sets.

A question to gauge complexity of the choice task was also included at the end of the choice questions to which approximately 9% indicated to have found the choice tasks difficult. Participants in DCE pilot were also asked for their opinions on the use of pictograms in

illustrating choice sets. It emerged that pictograms reportedly aided comprehension of the alternatives in the choice sets.

Results from the pilot showed that signs of parameter estimates for the attributes were in the expected direction thus indicated preliminary confidence in respondent efficiency. The modifications made to the DCE questionnaire based on the pilot study included: generating a full set of pictograms explaining every attribute level prior to undertaking the choice tasks; exploring better ways of prompting responses on household income; and retention of the binary forced choice set. Field supervision of DCE data collection was undertaken through observation during data collection. Random spot checks were also undertaken where selected participants were visited to verify their participation in the study and the kind of questions they were asked. On average, spot checks were undertaken in a third of all participants in the DCE study.

7.3 Results of a Discrete Choice Experiment

As indicated earlier in section 7.2.2, 338 care givers constituted sample for this DCE study. All the 6084 observations (from a set of responses of 338 respondents providing a choice from all 9 choice sets each with 2 alternatives; 338x9x2) were available. This section presents the following: characteristics of respondents, marginal utility from various health system attributes thereby denoting relative significance of health system attributes in influencing health facility choice, and marginal rates of substitution namely Willingness To Pay (WTP) and Willingness To Wait (WTW). Subgroup analysis results are also presented.

7.3.1 Characteristics of respondents

The characteristics of respondents to the DCE questionnaire are presented in table 7.2. The mean age of care givers is 29 (SD = 7, range, 17 – 63) and their parity averaged 3 (SD = 1, range, 1 – 6). Information on household monthly income represented additional household characteristic to that collected through baseline questionnaire of the longitudinal study design. Households' monthly income averaged 22,500 Malawi Kwacha (MK) ($75)[1] (SD 19,761, range 3,000 – 150,000). Household monthly income was categorised in three levels namely: low, which included household with a monthly income of MK3,000 to MK14,000 ($10 - $46); average for household monthly income of MK15,000 to MK20,000 ($50 - $66); and

[1] As per prevailing exchange rate of 1USD to MK300 at the time of data collection

high for households with monthly income above MK20,000 (> $66). This categorisation was on the basis of relative income levels as per household monthly income distribution in the sample.

The majority of care givers 238 (70.4%) were of no education or primary school education level. Likewise most of the care givers were married (92.3%). With regard to occupation, self-employed or undertaking small scale businesses and no activity represented two of the commonest occupational activities, with only 12% indicating to have formal employment either in the public or private sector. In general, care giver, child and household characteristics such as those in table 7.2 and those not shown, for those who participated in the DCE design were not significantly different from the entire sample of this PhD research (statistical significance results not shown in the table).

Table 7.2: Characteristics of the DCE study participants

Variable	Frequency N = 338 (%)
Slum name	
Senti	86 (25.4%)
Mgona	113 (33.4%)
Ntandire	139 (41.2%)
Care givers age (Years)	
16 – 25	120 (35.5%)
26 – 30	101 (29.9%)
31 +	114 (33.7%)
Monthly income	
Low	105 (31.1%)
Middle	124 (36.7%)
High	109 (32.2%)
Education	
No education / Primary	238 (70.4%)
Secondary +	96 (28.4%)
Occupation	
No activity	159 (47.1%)
Self-employed / Small scale business	138 (40.9%)
Employed	41 (12%)
Marital Status	
Single/Widow/Divorced	26 (7.7%)
Married	312 (92.3%)

7.3.2 Magnitude and statistical significance of attributes: Random effects logit regression analysis results

A random effects logit regression model was performed to estimate contribution of respective attributes to choice utility. Results are shown in table 7.3. The model is highly

statistically significant ($P < 0.001$) indicating that it has improved explanatory power compared to a model where only constant terms were included. The constant term is statistically insignificant suggesting that the outcome of interest (choice of health facility) is only affected by the attributes in the model and that care givers did not have a *priori* inclination to choosing a particular health system attribute.

For discrete attributes of: availability of medicine; attitude of health workers and nature of examination, the lower attribute levels, namely: medicines not available, negative/poor attitude of health worker, and child not examined as health worker only writes, respectively, were treated as reference categories.

With the exception of distance to health facility (time it takes to walk to health facility) and superficial examination, all other attributes are statistically significant. Hence, choice data from this DCE study did not find evidence of association between distance to the health facility and choice of a health facility for under-five child health services among care givers in urban slums. Similarly, superficial examination slightly fell short of statistical significance ($P = 0.056$). On the other hand, thorough examination, waiting time, cost of health care, availability of medicines, and attitude of health worker are highly significant asserting their relevance as health system factors considered in decision making to seek care in the event of childhood morbidity.

The estimated coefficients for all the statistically significant attributes have an expected sign rendering theoretical validity of the direction of the effect. Attributes with a negative sign indicate that care givers were averse to choosing the respective attribute. For instance, cost and waiting time are negatively associated with overall choice of a health facility, as expected, indicating care givers disutility with higher cost and longer waiting time. Likewise, for three other attributes of availability of medicine, attitude of health workers, and nature of examination, their positive coefficients, as expected, represent a gain in utility by comparison with their reference categories. Precisely, the positive coefficient entails that a care giver is likely to prefer a higher level of the respective health system attributes.

The size of the coefficient is an indication of its strength of relevance in the choice. In other words, an attribute with the highest coefficient size derives the highest marginal utility relative to other attributes (components) of under-five child health care service. For

categorical attributes, coefficients are also indicative of shift of utility for a marginal shift from reference to level of interest. For attributes treated as continuous variables namely cost and waiting time, the coefficients entail a shift in utility for a unit increase in the attribute.

The results indicate that availability of medicines (β = 1.479, *P <0.01*) had the greatest marginal influence on care givers' preferences of a health facility compared to other attributes. Thorough examination of the sick child (β = 0.672, *P <0.01*) and attitude of health worker (β = 0.624, *P <0.001*) are the other two variables rated highly at margin (second and third respectively) in care givers' preference of a health facility. Waiting time (β = -0.311, *P <0.01*) was the fourth most important factor followed by cost of health care attribute (β = -0.0004, *P <0.001*) which was marginally the least considered.

Table 7.3: Random effects logit estimation results of preference of under-five child health services by care givers in urban slums

Health system attribute	Coefficient (β)	Standard Error	95% CI
Medicines and equipment are available	1.4792 **	0.4593	0.5791, 2.3793
Thorough examination of the child	0.6721**	0.2494	0.1833, 1.1610
Good attitude of health worker	0.6237***	0.1744	0.2820, 0.9655
Waiting time	-0.3114**	0.1063	-0.5198, -0.1030
Superficial Examination	0.2481	0.1300	-0.0067, 0.5029
Cost of health care	-0.0004***	0.0001	-0.0006, -0.0002
Distance	0.0005	0.0013	-0.0021, 0.0031
Constant	0.0522	0.0628	-0.0708, 0.1752
Model Statistics			
Number of observations	3042		
Log Likelihood	-1383.7228		
Wald Chi^2 (7)	14.78		
Prob> (Chi^2)	<0.05		

Significance levels of coefficients: *** = *P <0.001;* ** = *P <0.01;* * = *P <0.05*

7.3.3 Test of consistency of choice

In order to test consistency of choice sets, two holdout questions that were included in the DCE questionnaire (questions 5 and 7; see Appendix IX) were used. The consistency test involves comparing the predicted and actual probabilities of choice of a Health Facility option in the hold outs. In this case, probabilities of choosing 'Health facility 1' were used.

To undertake this test, the following steps were involved. Firstly, the deterministic utilities of health facility 1 and health facility 2 were calculated as per choice model estimation below

(as presented in section 7.2.5) and using coefficients from the random effects logit estimation (see table 7.3)

$$V_{Hospi} = \beta_{0i} + \beta_{1i}medicines + \beta_{2i}examination + \beta_{3i}attitude_{HW} + \beta_{4i}cost + \beta_{5i}distance + \beta_{6i}wait_{time}$$

Substituting the above formula with attribute coefficients and levels from hold outs (questions 5 and 7), produces as follows:

V (5 HF1) = 0.052204 + (1.479193*1) + (0.2480666*0) + (0.6721324*0) + (0.6237449*0) + (- 0.0003804*0) + (0.0004948*90) + (-0.3114037*3.5)

= 0.052204 + 1.479193 + (0.0004948*90) + (-0.3114037*3.5) = ***0.486016***

V (5 HF2) = 0.052204 + (1.479193*0) + (0.2480666*0) + (0.6721324*1) + (0.6237449*1) + (- 0.0003804*1700) + (0.0004948*30) + (-0.3114037*2)

= 0.052204 + 0.6721324 + 0.6237449 + (- 0.0003804*1700) + (0.0004948*30) + (-0.3114037*2) = ***0.093438***

V (7 HF1) = 0.052204 + (1.479193*1) + (0.2480666*1) + (0.6721324*0) + (0.6237449*1) + (- 0.0003804*0) + (0.0004948*90) + (-0.3114037*3.5)

= 0.052204 + 1.479193 + 0.2480666 +0.6237449 + (0.0004948*90) + (-0.3114037*3.5)

= ***0.711148***

V (7 HF2) = 0.052204 + (1.479193*0) + (0.2480666*1) + (0.6721324*0) + (0.6237449*1) + (- 0.0003804*1700) + (0.0004948*60) + (-0.3114037*5)

= 0.052204 + 0.2480666 + 0.6237449 + (- 0.0003804*1700) + (0.0004948*60) + (-0.3114037*5) = ***-0.82593***

Secondly, the predicted probability of choosing health facility 1 from choice sets of the hold out was calculated using the probability formula below:

$$p_{in}(x_n, \beta) = \frac{e^{x_{in}\beta}}{\sum_{j=1}^{J_n} e^{x_{jn}\beta}}$$

Applying the above formula in this DCE is therefore expressed as below:

$$p_{HF1}(x_n, \beta) = \frac{e^{V_{HF1}}}{e^{V_{HF1}} + e^{V_{HF2}}}$$

where $p_{HF1}(x_n, \beta)$ is the predicted probability of choosing health facility 1, $e^{V_{HF1}}$ is an exponential of the deterministic utility of health facility 1 and $e^{V_{HF2}}$ is the exponential of deterministic utility of health facility 2.

Therefore, substituting the formula above the predicted probabilities of choosing Health Facility 1 in holdout questions choice sets 5 and 7 are as calculated below:

$$Pred.prob\ (5HF1) = \frac{e^{0.486016}}{e^{0.486016} + e^{0.093438}} = 0.596$$

$$Pred.prob\ (7HF1) = \frac{e^{0.711148}}{e^{0.711148} + e^{-0.82593}} = 0.823$$

The third step entailed calculating the actual probability of choosing health facility 1 in the hold outs, which is given by the frequency calculation. In this case, 175 and 280 of 338 care givers chose health facility 1 for holdout questions 5 and 7 respectively. Hence the actual probabilities are calculated as below:

$$Actual.prob(5HF1) = \frac{175}{338} = 0.517$$

$$Actual.prob(7HF1) = \frac{220}{338} = 0.650$$

The fourth and final step entailed comparing the predicted and actual probabilities. As per steps outlined above, predicted probability for health facility 1 in the first hold out was 0.60 while its actual probability was 0.52. For the second hold out choice set, predicted and actual probabilities were 0.82 and 0.65 respectively. In both cases, probabilities entail the same direction of choice. In other words for holdout 5, the predicted probability favours choice of health facility 1 and the actual choices of care givers in this hold out also indicates that health facility 1 was favourable in holdout question 5. The same is applicable to predicted and actual probabilities for holdout question 7. Furthermore, in each of the hold outs, predicted and actual probabilities are close enough to each other albeit a wider difference for holdout question 7.

In light of the results of the above calculation of consistency of participants' responses, the general picture therefore is that care givers were consistent in their choices. This entails that they had given thorough consideration to options in each choice set and an argument for respondent efficiency and validity of results can be comfortably advanced.

7.3.4 Estimating Marginal Rates of Substitution

Two forms of average marginal rates of substitution were estimated, namely; mean marginal Willingness To Pay (WTP) and mean marginal Willingness To Wait (WTW) which respectively reflect the cost and time trade-offs for a unit increase in a particular health system attribute by an average care giver. The average marginal WTP is calculated by dividing the coefficient of the attribute of interest by the negative coefficient of the cost of health care attribute. Likewise the average marginal WTW entails dividing coefficient of a variable of interest by the negative coefficient of the waiting time attribute. To illustrate, marginal WTP and WTW for availability of medicines and supplies at a health facility for an average care giver, are respectively, expressed as; $\frac{\beta_{medicine}}{-\beta_{cost}}$ and $\frac{\beta_{medicine}}{-\beta_{wait}}$. The estimated marginal WTP and WTW results are shown in table 7.4 below. These estimates essentially reflect the value attached to respective attributes in monetary and time (hours) terms.

Care givers were willing to pay approximately MK3888.49 ($13) (95% CI 2810 – 4936) for a health facility that had medicines available compared to the one without medicines. Similarly, care givers were willing to pay MK1764 ($6) (95% CI 652 – 28976) for a thorough examination of the child compared to no examination of the child. On the other hand care givers were willing to pay MK648 ($2) (95% CI 23 – 1274) for a superficial examination of the child compared to no examination. This suggests that care givers were willing to pay about MK1116 ($4) for a move from a superficial to a thorough examination of the child. Furthermore care givers are willing to pay MK812 ($3) (95% CI 601 – 1024) for an hour's reduction in waiting time at the health facility

With regard to time trade off, care givers are willing to wait for approximately five hours (4.8) (95% CI 3.5 – 6) at a health facility where they will find all medicines and supplies available for their sick child compared to the one where there are no medicines for their sick child. Compared to their child not being examined, care givers were willing to wait for 0.8 hours (48 minutes) (95% CI 6 – 96 minutes) for superficial examination and for 2.2 hours (95% CI 0.7 – 3.7 hours) for a thorough examination of the child. Thus this suggests that care giver were willing to wait close to an additional one and half (1.4) hours to move from superficial to thorough examination of their child. And care givers were willing to wait for 2 hours (95% CI

1.5 – 2.6) to be attended to by a health worker with good attitude compared to a health worker with negative attitude.

Table 7.4: Marginal WTP and WTW estimates for health system attributes of under-five child health services

Health system attribute	WTP Estimate	95% Confidence Interval	WTW Estimate	95% Confidence Interval
Medicines and supplies are available	3888.49	2774.30 - 5002.68	4.8	3.5 – 6.0
Waiting time	818.62	592.58 - 1044.65	NA	NA
Good attitude of health worker	1639.70	1198.09 - 2081.30	2	1.4 – 2.6
Superficial examination	652.12	31.65 - 1272.58	0.8	-0.05 - 1.6
Thorough examination	1766.90	659.48 - 2874.31	2.2	0.7 – 3.7

Note: Distance to health facility is not included because if was not statistically significant. Superficial examination has been included because it was close to statistical significance.

7.3.5 A subgroup analysis of utility of health facility by slum residence and household monthly income

Subgroup analyses were undertaken to determine relative significance of attributes determining preference of a health facility by slum residence; household monthly income; care giver's education level; and age. Results are presented in tables 7.5 and 7.6 below. As it can be noted from tables 7.5 and 7.6, just like model estimation for the whole sample, availability of medicines is the most important attribute across all levels of respective subgroups in the analysis. However, relative importance of other health system attributes varies within categories of respective subgroups.

Subgroup analysis by slum residence shows that whilst attitude of health workers, represents the second most important health system attribute determining preference in Senti (β = 0.834, P <0.001) and Ntandire (β = 0.733, P <0.001), in Mgona, a thorough examination (β = 1.03, P <0.01) represents the second most important attribute. Rather surprisingly, even thorough examination is statistically insignificant for care givers from Senti. Waiting time and cost of health care remain important considerations as they are highly statistically significant and care givers are averse to them. Cost of health care remains the least in marginal utility contribution relative to other health system attributes.

With regard to household income levels, examination of the child, whether superficial or thorough was statistically insignificant among low level income households but both superficial and thorough examination were significant for middle and high level income

households. Care givers from all household income levels derived greatest marginal utility from a health facility with medicines available for the sick child. Thorough examination was the second most important health system attribute for care givers from middle ($\beta = 0.91$, $P < 0.01$) and high ($\beta = 0.87$, $P < 0.01$) income households. On the other hand, attitude of health worker ($\beta = 0.63$, $P < 0.01$) is the second most important attribute for low income households and a third for middle and high income households. Waiting time and cost are also statistically significant across household income levels and respondents in all income groups are averse to both of them.

Subgroup analysis by education level of care givers shows that more variables are important to care givers with no to primary level of education than to those with secondary level and above. While only distance to health facility is insignificant among care givers with primary or lower education, for care givers with secondary and above education, both levels of examination (superficial and thorough) are surprisingly insignificant. Both education level categories derive greatest utility from availability of medicines albeit those with education of secondary and above find greater utility ($\beta = 1.69$, $P < 0.001$) than those with primary or lower education ($\beta = 1.38$, $P < 0.05$). Nonetheless, the relative significance of health system attributes is different between the two categories. For instance, attitude of a health worker ($\beta = 0.64$, $P < 0.001$) and waiting time ($\beta = -0.39$, $P < 0.001$) are the second and third most important of the significant health system attributes for care givers with secondary and higher education whilst a thorough examination of the child ($\beta = .73$, $P < 0.05$) and attitude of health worker ($\beta = 0.62$, $P < 0.05$) rank second and third respectively among those with primary and lower education. Care givers in both education level groups are averse to cost of health care and waiting time.

In terms of care givers age, distance to health facility was not statistically significant among all age groups. Superficial examination of the child was insignificant for care givers aged 26 to 30 years while both superficial and thorough examination were insignificant for care givers aged 31 and above. All age groups derive the greatest utility from availability of medicines: $\beta = 1.47$, $P < 0.001$; $\beta = 1.47$, $P < 0.001$; and $\beta = 1.52$, $P < 0.001$ respectively for care givers age groups of 20-25; 26-30; and 31+ years. Thorough examination of the child and attitude of a health worker are the second and third most important for care givers in age groups of 20-25 and 26-30 years whereas attitude of health worker and waiting time represent the second

and third most important factors for care givers aged 31 or above. All age groups express disutility for cost of health care and waiting time.

Table 7.5: Random effects logit estimation results of preference of under-five child health services by slum residence and household income

	Slum residence			Level of income		
	Senti	Mgona	Ntandire	Low	Medium	High
	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)	β (95% CI)
Distance	0.003 (-0.002, 0.0085)	0.0003 (-0.0039, 0.0046)	-0.0003 (-0.0043, .0036)	-0.0004 (-0.0046, 0.0038)	0.0008 (-0.0034, 0.0050)	0.0014 (-0.0034, 0.0063)
Medicines available	1.575 (1.345, 1.806)***	1.4243 (0.8428, 2.0059)***	1.4479 (1.0777, 1.8180)***	1.2504 (0.3716, 2.1292)**	1.4677 (0.8284, 2.1071)***	1.7089 (1.4026, 2.0151)***
Waiting time	-0.367 (-0.553, -0.181)***	-0.2405 (-0.4071, -0.7400)**	-0.3115 (-0.4625, -0.1605)***	-0.3065 (-0.5490, -0.0641)*	-0.3132 (-0.5053, -0.1210)**	-0.2813 (-0.4415, -0.1212)**
Attitude of health worker	0.834 (0.547, 1.120)***	0.3177 (0.0728, 0.5627)**	0.7381 (0.4887, 0.9877)***	0.6348 (0.2014, 1.0681)**	0.5523 (0.2657, 0.8389)***	0.6761 (0.4245, 0.9276)***
Superficial examination	0.356 (-0.137, 0.849)	0.1803 (-0.1802, 0.5409)	0.2797 (-0.6411, 0.6236)	-0.0468 (-0.3948, 0.3011)	0.4189 (0.0168, 0.8209)*	0.4572 (0.2055, 0.8938)*
Thorough Examination	0.416 (-0.229, 1.062)	1.0326 (0.3789, 1.6863)**	0.6276 (0.1382, 1.1169)*	0.3041 (-0.2625, 0.8707)	0.9092 (0.2800, 1.5384)**	0.8673 (0.2814, 1.4533)**
Cost	-0.0005 (-0.0008, -0.0004)***	-0.0002 (-0.0004, --4.5200)*	-0.0004 (-0.0005, -0.0002)***	-0.0004 (-0.0008, -0.0001)**	-0.0004 (-0.0006, -.0001)***	-0.0003 (-0.0005, -0.0001)**
Constant	-0.104 (-0.350, 0.142)	.04402 (-0.1647, 0.2527)	0.1488 (0.0416, 0.3392)	0.0274 (-0.1737, 0.2885)	.0028 (-0.2020, 0.2076)	0.1167 (-0.1165, 0.3500)
Model Statistics						
Number of observations	774	1017	1251	945	1116	981
Log Likelihood	-335.01856	-466.50878	-568.06727	-474.95637	-490.60096	-405.06162
Wald $Chi^2(7)$	230.31	25.26	56.58	9.24	22.74	136.51
Prob> (Chi^2)	*P <0.001*	*P <0.001*	*P <0.001*	*P = 0.235*	*P <0.01*	*P <0.001*

Significance levels of coefficients: *** = *P <0.001;* ** = *P <0.01;* * = *P <0.05*

Table 7.6: Random effects logit estimation results of preference of under-five child health services by age and education level of care givers

	Education level of care giver		Age of care giver (years)		
	No education/Primary	**Secondary and above**	**20 - 25**	**26 - 30**	**31 and above**
	β (95% CI)	**β (95% CI)**	**β (95% CI)**	**β (95% CI)**	**β (95% CI)**
Distance	0.0005 (-0.0025, 0.0035)	.00006 (-0.0054, 0.0053)	-0.0001 (-0.0044, 0.0043)	0.0001 (-0.0043, 0.0046)	0.0011 (-0.0035, 0.0056)
Medicines available	1.3822 (0.1451, 2.6194)*	1.6940 (1.4582, 1.9297)***	1.4688 (1.1325, 1.8051)***	1.4682 (0.7634, 2.1730)***	1.5153 (0.8910, 2.1397)***
Waiting time	-0.2846 (-0.5600, -0.0091)*	-0.3890 (-0.5643, -0.2137)***	-0.3007 (-0.4555, -0.1460)***	-0.2238 (-0.4079, -0.0397)*	-0.4109 (-0.6232, -0.1987)***
Attitude of health worker	0.6174 (0.1310, 1.1038)*	0.6369 (0.3862, 0.8876)***	0.6229 (0.3823, 0.8635)***	0.5646 (0.2282, 0.9010)**	0.6891 (0.3663, 1.0118)***
Superficial examination	0.2147 (-0.0975, 0.5270)	0.3519 (-0.1063, 0.8100)	0.5137 (0.1190, 0.9085)*	0.2547 (-0.1439, 0.6533)	-0.0323 (-0.4038, 0.3391)
Thorough Examination	0.7262 (0.0279, 1.4246)*	0.4903 (-0.1426, 1.1233)	0.8745 (0.3283, 1.4208)**	0.9396 (0.2829, 1.5963)**	0.2156 (-0.3421, 0.7732)
Cost	-0.0003 (-0.0006, -0.00005)*	-0.0005 (-.0007, -0.0003)***	-0.0004 (-0.0006, -0.0002)***	-0.0002 (-0.0004, -0.00001)*	-0.0005 (-0.0008, -0.0003)***
Constant	0.0363 (-0.1059, 0.1785)	0.1045 (-0.1390, 0.3481)	0.0911 (-0.1181, 0.3003)	-0.0257 (-0.2509, 0.1994)	0.0777 (-0.1310, 0.2864)
Model Statistics					
Number of observations	2142	864	1080	909	1026
Log Likelihood	-1009.0574	-360.08429	-478.72726	-421.07843	-468.2654
Wald $Chi^2(7)$	7.61	272.49	83.17	18.68	25.49
Prob> (Chi^2)	*P = 368*	*P <0.001*	*P <0.001*	*P <0.01*	*P <0.001*

Significance levels of coefficients: *** = *P <0.001;* ** = *P <0.01;* * = *P <0.05*

7.3.6 Subgroup analysis of estimated Marginal Willingness to Pay and Willingness to Wait

Marginal WTP and WTW were also estimated for care givers according to slum residence, household monthly income, education level, and age. Results of WTP and WTW are presented in table 7.7. Intuitively, WTP and WTW results in respective categories of subgroups are consistent with results from random effects logit analysis, particularly with regard to relative significance of health system attributes in contributing to preference of under-five child health services.

In terms of slum residence, care givers from Mgona are willing to pay far much more (K6815.06; $23) and willing to wait much longer (5.9 hours) for availability of medicines for their sick child relative to those from Senti (WTP = K2634.51, $9; WTW = 4.3hrs) and Ntandire (WTP = K3950.91, $13; WTW = 4.7hrs). Furthermore, care givers from Mgona are also willing to pay much more (K4940.66, $16) and willing to wait significantly longer (4.3hrs) for thorough examination of their child than their counterparts from Senti (WTP = K696.48, $2; WTW = 1.1hrs) and Ntandire (WTP = K1712.56, $6; WTW = 2hrs). Care givers from Ntandire are willing to pay slightly more and willing to wait a little longer (WTP = K2014.32, $7; WTW = 2.4hrs) compared to those from Mgona (WTP = K1520.30, $5; WTW = 1.3hrs) and Senti (WTP = K1393.99, $4.6; WTW = 2.3hrs) for a health worker with a good attitude and who treats them with respect.

Care givers from high income households are willing to pay more and wait longer (WTP = K5360.99, $18; WTW = 6hrs) for availability of medicines and supplies than their counterparts from middle income (WTP = K4060.20, $14; WTW = 4.7hrs) and low income (WTP = K2788.37, $9; WTW = 4.1hrs) households. A similar trend is observed for WTP and WTW values for all other health system attributes.

Marginal WTP and WTW estimates for availability of medicines reveal that respondents aged between 26 and 30 years are higher (WTP = K6352.06, $21; WTW = 6.6hrs) compared to their counterparts aged 20 to 25 (WTP = K3803.84, $13; WTW = 4.9hrs) and 31 years and older (WTP = K2932.36, $9.70; WTW = 3.7hrs). A similar trend is observed for attributes of waiting time, good attitude of health worker and a thorough examination of the child.

With regard to education level, care givers with no to primary education were willing to pay much higher and willing to wait longer (WTP = K2084.80, $7; WTW = 2.6hrs) for a thorough examination of their child compared to those with secondary education and above (WTP = K1028.72, $3.4; WTW = 1.3hrs). Likewise, for other health system attributes, lesser educated care givers are willing to pay slightly higher and willing to wait slightly longer. However, care givers from both education level categories are willing to pay the same amount (WTP = K816, $3) for an hours reduction in waiting time.

Table 7.7: Marginal WTP and WTW by slum residence, household income, age and education level of care givers

	Slum name						Income level of care givers					
	Senti		Mgona		Ntandire							
	WTP	WTW	WTP	WTW	WTP	WTW	WTP	WTW	WTP	WTW	WTP	WTW
Medicines available	2634.51	4.3	6815.06	5.9	3950.91	4.65	2788.37	4.1	4060.20	4.7	5360.99	6.0
Waiting time	613.85	NA	1150.94	NA	850.05	NA	683.63	NA	866.26	NA	882.61	NA
Attitude of health worker	1393.99	2.3	1520.30	1.3	2014.32	2.37	1415.52	2.1	1527.84	1.8	2120.96	2.4
Superficial examination	595.40	0.9	862.81	0.7	763.33	0.9	104.42	0.2	1158.70	1.3	1434.23	1.6
Thorough Examination	696.48	1.1	4940.66	4.3	1712.56	2.0	678.21	1	2515.15	2.9	2720.97	3.1
Cost	NA				NA	0.001	NA	0.001	NA	0.001	NA	0.001
	Age of care giver						Education of care giver					
	20 - 25		26 - 30		30 and above		No educ/Primary		Secondary +			
	WTP	WTW	WTP	WTW	WTP	WTW	WTP	WTW	WTP	WTW		
Medicines available	3803.84	4.9	6352.06	6.6	2932.36	3.69	3967.97	4.9	3553.85	4.4		
Waiting time	778.80	NA	968.33	NA	795.22	NA	816.96		816.08	NA		
Attitude of health worker	1613.19	2.1	2442.63	2.52	1333.40	1.68	1772.27	2.2	1336.21	1.6		
Superficial examination	1330.41	1.7	1102.04	1.1	62.60	0.1	616.47	0.8	738.21	0.9		
Thorough Examination	2264.83	2.9	4065.23	4.2	417.19	0.5	2084.80	2.6	1028.72	1.3		
Cost	NA	.001		.001			NA		0.001			

7.4 Discussion of DCE findings

The World Health Organisation posits that responsiveness to people's expectations is one of the intermediary goals of a health system (WHO, 2007). Arguably a well-functioning health system delivers quality health services that attain client/patient satisfaction and ultimately have an effect of promoting utilisation of health services by the population in need of them. It is acknowledged that quality of health services is multidimensional suggesting that various features of a health system broadly, or narrowly a health facility as a point of health service provision, are important to varying degrees but collectively define quality of health care.

As cited earlier, this DCE study was aimed at determining the relative significance of health system factors in influencing decisions to seek child health care from a health facility in the event of childhood illness. The study found that among the attributes considered in this study, availability of medicines has the highest marginal importance in deciding use of under-five child health services. Thoroughness of child examination, attitude of health worker, waiting time, and cost of health care, in that order of importance (as determined by size of the coefficients, Willingness-To-Pay and Willingness-To-Wait estimates), were also significantly associated with health facility choice.

There is dearth of evidence from DCE studies in health services in developing country context. This limits comparison of findings from this DCE with those from other similar settings. Granted, these findings suggest that supply side factors constituting both technical and non-technical health care quality are important considerations for child health service utilisation. For example, the high value attached to availability of medicines is indicative of the need for access to high technical quality of child health care which ultimately defines realised access, which entails utilisation of health services as per Andersen's health utilisation model. Qualitative evidence from Zambia (Baume et al., 2000) and Malawi (Chibwana et al., 2009) has similarly posited the importance of availability of medicines to care givers of under-five children. Indeed drawing from findings of qualitative inquiry through FGDs in this PhD research, participants suggested

that it would be worthless to go to a health facility where, after going through all the other processes of consultation and encountering long queues, one is told at the end that there are no medicines for their sick child hence they have to buy.

A thorough examination of the sick child was also highly considered in the preference, further indicative of the value attached to technical element of quality of child health care. However, non-technical elements of quality health care were considered very important as well, and in some cases considered to be more important than the technical quality features. For example, attitude of health workers contributed a higher utility, WTP and WTW estimates than superficial examination of the child and its coefficient size was almost equal to that of thorough examination in the larger sample.

To illustrate, in sub-group analyses, attitude of health worker contributed a higher utility than thorough examination among care givers resident in Senti and Ntandire. This is consistent with findings of DCE study in urban Zambia where avoiding a rude staff member was considered more important (as determined by willingness to pay) compared to drug availability (Hanson et al., 2005). Similarly, in a population based DCE study estimating women's preference for place of delivery in rural Tanzania, attitude of health provider and availability of drugs were the two most important health system features but attitude of health provider had the highest parameter estimates (Kruk et al., 2009)

Both waiting time and cost of health care were statistically significant and associated with disutility in a health facility as indicated by negative coefficients. While the size of the coefficient for the cost attribute was the lowest, waiting time was relatively considered higher than superficial examination suggesting that avoiding longer waiting times was more important than having a child examined superficially. Recent DCE studies conducted in Europe to elicit preferences for health service attributes found waiting time to be one of the most important attributes (de Bekker-Grob et al., 2012). Reduction of waiting times has been integral to discourse in developed countries' health systems while it has arguably remained in the periphery in similar discourses in developing countries.

Understandably, health systems in developing countries are faced with numerous challenges to the extent that reduction in waiting times may not be of immediate primary importance, at least from the perspective of health workers, health planners and policy makers. Nonetheless, this study suggests that waiting time is one of the important consideration in health facility use. A DCE study in urban Lusaka, Zambia on important health quality dimensions of child and adult health services also found that waiting time was an important feature of a health facility (Hanson et al., 2005).

In general, the findings of this study are consistent with findings from other DCE studies in the developing countries even though the relative importance of health system attributes are in some ways different. For example similar to this study findings, a study in Ethiopia on women's preference for obstetric care found availability of drugs and equipment as the most important feature of a health facility, followed by provider type and attitude of health provider (Kruk et al., 2010). A similar study in rural Tanzania also found reliable access to drugs and equipment, and provider attitude as the two most important utility features of a health facility, with other important attributes being provider type, cost, distance and availability of transport (Kruk et al., 2009). In Zambia, a thorough examination was the most important health system characteristic, followed by avoiding rude staff and availability of drugs (Hanson et al., 2005).

Distance to health facility, whether using Euclidean measures or travel time has conventionally been regarded as a crucial determinant of health care utilisation, and ultimately choice of a health provider. Other DCE studies focussing on obstetric health care utilisation have similarly found distance as an important attribute albeit of a relatively lower utility contribution to choice of health provider (Kruk et al., 2010). In contrast, the current DCE did not find evidence of distance effect in utility contribution.

Based on their findings in a DCE study in Ethiopia, Kruk et al., (2010) posited that the relatively low importance of travel time was due to the fact that women in the study setting sometimes sought care from distant health facilities which they perceived offered higher quality health care. They concluded that where quality is concerned people may

take little consideration of the distance they have to travel. A similar decision making mechanism may have been at play in responding to DCE questions in the context of this study, where distance may not have been considered as important in the presence of other health system attributes. Indeed, FGDs suggested that at times care givers bypass their primary health facilities in favour of a referral facility within the city and which is farther away but for which care givers perceive it offers child health care services of better quality. While longitudinal study findings only found about 10% of care givers to have reported utilising the referral facility, this behavioural phenomenon might contribute to the little consideration for distance in the DCE, rendering it insignificant.

In all subgroup analyses, results mirrored the aggregate sample analysis in that availability of medicines derived the highest utility, WTP and WTW. However, within group differentials were noted in marginal influence of other health system attributes. For example, attitude of health worker emerges as the second most important for care givers in Senti and Ntandire, with thoroughness in examination of the child coming in third. Furthermore, Mgona care givers have higher marginal WTP and WTW estimates in all health system attributes than those from Senti and Ntandire which have almost similar estimates. Based on contextual knowledge and findings from qualitative and longitudinal (especially baseline results), both Senti and Ntandire mostly use the same public health centre while Mgona uses a different one. It is probable that experiences of care givers from these two areas with the health facility influenced their valuations of the health provider attitude.

For example if care givers experience is that health workers undertake a fair examination of their children but lack respect towards care givers, it is probable that such experiences may result in higher consideration for attitude of health worker than nature of examination. Indeed Kruk et al. (2010) argued that people draw upon their experiences of local health services or that of their families or friends when undertaking DCE exercises. This is corroborated by Leonard et al. (2009) who, based on their findings of a study in Tanzania, have posited of evidence of active social learning about clinicians and the health system as a whole.

Superficial examination was close to statistical significance in the aggregate sample and far from significant for care givers from low income households, both categories of education level, and care givers aged 26-30 and above 31 years in subgroup analyses. This is intuitively logical in that a superficial examination entails deficits in management of the sick child hence less likely to be considered highly even by comparison to a child not being examined. Surprisingly, even thorough examination is not statistically significant for care givers from Senti, low income households, those of secondary education and above, and care givers aged 31years or above. It is probable that the older care givers exhibited some experience with childhood illnesses hence had some knowledge of treatment to an extent that the nature of examination may not have been a significant concern, rather the prescribed and availability of medicines as treatment. Similarly, more educated care givers may have had some treatment knowledge rendering nature of examination of little significance than availability of prescribed treatment. Consistent with this assertion more educated care givers had a higher marginal utility estimate for availability of medicines than less educated ones (β 1.69 compared to β 1.38) and likewise care givers aged 31 years or above had higher utility estimates for availability of medicines compared to their younger counterparts (β 1.52 versus β 1.47).

This notwithstanding, the exact reasons for counterintuitive results on thorough examination in some subgroup analyses are unclear from this study. Undertaking a post-DCE analysis qualitative inquiry to understand this phenomenon should have been ideal. Due to design and time constraints, this was not followed up.

Inclusion of cost of health care attribute in the Malawi context where health services in public health facilities (which a majority of study participants use) are free at the point of use required specific methodological considerations. It is argued that in such contexts the inclusion of cost attribute in DCEs may result in respondents providing protest responses under the impression that the intention of the study is to introduce user-fees in health facilities (Ryan, 2012). Such protest responses may include: declining to make a choice for choice sets with a cost value; or always opting for the no cost or lower cost options even

when realistically their choice could have been another existing option. Ultimately, this undermines the validity of the study findings.

To counteract this, deliberate efforts were made to provide constant explanations and clarifications to respondents during pilot and main data collection. Specifically, the following statement was stated iteratively to respondents: *"while we have included cost in characteristics of health facilities from which you are asked to choose, we do not mean or suggest that the Government intends to introduce user-fees in public health facilities. Instead, we would like you to imagine as though services were being charged, and realistically provide us your choice under the circumstances. In other words, we only want to understand your monetary valuations of these health system characteristics".* The motivation to include cost, besides it being mentioned as an important factor influencing care seeking decisions in literature, was the opportunity to estimate 'marginal WTP' which arguably provides a more perceptible way of valuations of health system attributes and levels.

The inclusion of cost of health care and waiting time attributes therefore allowed for estimation of marginal rates of substitution of WTP and WTW. It is noteworthy that consistent with random effects logit estimation results, availability of medicines is highly considered as care givers were willing to pay as high as MK3888 ($13) or to wait approximately 5 hours. This valuation is about twice as high compared to thorough examination of the child (WTP = MK1766, WTW = 2.2hrs) and attitude of health worker (WTP = MK1639, WTW = 2hrs) which come second and third in relative importance. It also entails that an average care giver was willing to pay 17% (marginal WTP (3888)/mean monthly household income (22500) of their monthly household income on seeking health care for her child from a health facility where medicines were available.

The level of private health facilities which study participants use would have user-fee charges of around an average of K1200 ($4) for treatment of a child with Acute Respiratory Infection symptoms. The WTP estimates in this study may thus be slightly overestimated for some attributes such as availability of medicines. Indeed some

arguments suggest that DCEs may overestimate WTP (Pokhrel, 2006). Therefore, as Kruk et al. (2010) argues, these WTP estimates should be interpreted with caution and are better off viewed as valuations of relative importance of attributes included in the DCE study than as absolute measures.

It was interesting to note that WTP corresponded with monthly household income as higher income households were willing to pay higher values than lower income households on all health system attributes. This is intuitively logical and suggests that while WTP estimates imply relative valuations of attributes, such decisions were based on relative household economic position. Specifically, the higher marginal WTP for care givers from high income households compared to those from low income households may relate to the differential opportunity cost of health care seeking. High income households may be involved in small scale businesses, employment or some active income generating activities hence a higher loss of income on their part is reflected in their higher WTP valuation of waiting time. These findings differ from those of Mangham et al. (2005) in Zambia where respondents of low socioeconomic status had higher marginal WTP estimates than those in a high socioeconomic class and there was hardly a difference in marginal WTP with regard to waiting time. Two reasons may be attributable to this difference. Firstly, the Zambia study had an overrepresentation of participants of higher socioeconomic status while this study typically involved low income groups. Secondly, there may have been differences in categorisation of socioeconomic subgroups considering that the Zambia study used wealth quintiles while this DCE used monthly household incomes. While both methods are acceptable, and others have argued that they may produce similar results, it is probable that this contributed to the difference.

It is worthwhile to note that this DCE study valuated the relative importance of health system features within the study. While acknowledging that these features represented the most important as derived from qualitative studies and literature, there are many factors in the background of these factors. For example, a reliable supply or availability of medicines and other medical supplies entails adequate and efficient health financing and a functional logistical system from national quantification through procurement and

distribution of medicines to health service delivery points including efficient management at the point of use. Similarly, the adequacy and motivation of health workers have direct implications on waiting times at the health facility. And regulation of health professionals by professional bodies such as the Medical Council of Malawi and the Nurses and Midwives Council of Malawi would have implications on quality of care aspects such as the nature of child examination and attitude of health workers within the patient-provider interaction/relationship. Specific health system challenges have been noted in most of the background health system factors.

In spite of the challenges, it is clear from these findings that supply side factors at the point of health service delivery are crucial in determining health care seeking for under five children and that these factors are of varying importance. Collectively, it can be argued, that they constitute technical and non-technical quality of child health care. A study by Collier et al. (2007) noted that higher quality of health care which constituted health measures including some attributes used in this DCE (availability of equipment, medicines and essential supplies, and qualified and professional staff), were associated with greater likelihood of health facility utilisation among people with episodic illnesses even after controlling for distance, women's education, and household wealth.

While the Health Sector Strategic Plan (2011-2016) and its preceding strategies and policy documents have acknowledged the need for strengthening the supply chain system for medicines and other medical supply, little has been discussed with regard to issues of thoroughness of examination, attitude of health workers and waiting times in health facilities particularly within the urban slum setting. On the other hand, proximity of health services has dominated the policy agenda, which is one key reason for a predominantly rural focus with regard to access to health services.

In order to guarantee external validity of findings from this DCE, it is acknowledged that a comparison of characteristics of study participants and that of the urban slum population in Lilongwe and/or Malawi was warranted. However information from the broader urban slum population was unavailable to undertake such comparisons. This

notwithstanding, the rigorous exercise undertaken in selecting respondents for this study as described in chapter 5 (section 5.2.4) arguably allow for generalisation of findings with urban slum settings in Malawi.

7.5 Strengths and limitations of the DCE study

7.5.1 Strengths of the DCE design

To the knowledge of the researcher, this DCE study eliciting relative importance of health system factors influencing care seeking decisions is the first to be conducted in Malawi, for children or adult health services, let alone in an urban slum setting. It therefore provides a unique perspective on relative importance of health system factors in eliciting demand for under-five child health services.

Related to the above, the use of a DCE design is a great strength because of the rigor involved in preference elicitation and valuations of attributes. Its advantages over other potential designs to measure the relative importance of health system factors influencing care seeking decisions have been elucidated earlier in section 7.2.1.

This DCE used pictograms for all choice questions which was an innovative way to surmount challenges pertaining to respondent efficiency. Specifically, this aided comprehension of the choice tasks effectively limiting cognitive burden to respondents, which is characteristic of DCE designs. Moreover, this strength is more prominent considering low education levels and illiteracy of study participants. Study participants evidently admitted that pictograms aided their comprehension of the choice task.

Identification of health system attributes and levels for this DCE study were based on literature, longitudinal study and qualitative inquiry. Attribute selection through qualitative inquiry and longitudinal study presents a particular strength for providing opportunity to include attributes important to study participants in their context thereby also maximising respondent efficiency.

7.5.2 Limitations of the DCE study design

This DCE used a forced choice format for which there is a criticism that respondents are compelled to make choices even when none of the options in the choice set is desirable. More importantly in health care, care givers may choose not to seek care at all. Thus, it is argued that forced choice formats overestimates parameter estimates.

While acknowledging this risk in the design, it is important to note that care givers were being asked to imagine that the severity of the child's condition warranted health care seeking. Besides, an alternative question format which included a neither option was used in pilot and less than 1% of the care givers opted out. This explanation notwithstanding, this limitation is acknowledged.

7.6 Conclusion

By focussing on important attributes of health system to potential users, this study contributes to evidence of the importance of health system factors in influencing care seeking decisions particularly for child health services. The results of the study strongly suggest that availability of medicines, thoroughness of child examination, attitude of health workers, reduction in waiting time, and cost are crucial in under-five child health service utilisation for urban slum care givers.

CHAPTER 8

INTEGRATED DISCUSSION OF FINDINGS FROM THE THREE STUDY DESIGNS

8.1 Introduction

This PhD research investigated child health and survival in urban slums in Malawi particularly focussing on health care seeking practices for under-five child health services among care givers in urban slums and the relative significance of health system factors in influencing their care seeking decisions. Six objectives were set out namely, to: 1) determine care givers response to childhood illnesses; 2) identify factors that influence decisions to seek health care outside the home for common childhood illnesses; 3) determine treatment actions focussing on significance of various health care providers (public and private health facilities, medicines in local shops, and traditional healers); 4) assess knowledge of danger signs in relation to childhood illnesses among care givers; 5) explore child care practices and their implications for child health; and 6) determine the relative significance of health system factors in health care seeking decision making.

To achieve these objectives, three study designs were applied to obtain a complete and validated picture of health care seeking for under-five children in urban slums: (i) a longitudinal study to determine under-five child morbidity, responses to child morbidity and determinants of health care seeking over a period of time; (ii) qualitative inquiry to get insight into responses to child morbidity, the organisation of and barriers to under-five child health services, and child care practices in an urban slum setting; and (iii) a DCE study to determine the relative significance of health system factors in influencing health care seeking decisions. To the PhD researcher's knowledge, it is the first time in Malawi that a robust mixed methods research investigating under-five child health services has been conducted in an urban slum setting.

The subsequent sections synthesise discussion of findings from these three study designs as follows: prevalence of childhood morbidity; responses to childhood morbidity;

determinants of health care seeking for under-five child health services; and social determinants of child health. This chapter also discusses these findings in light of the Andersen health utilisation model used for this PhD research (see chapter 4). As noted earlier, the Andersen model was used in the context of questionnaire development, guiding content in literature review, and discussion of findings based on overarching principles of the model.

8.2 Prevalence of under-five childhood morbidity in urban slums

Consistent with assertions of a high burden of childhood diseases in urban slums (APHRC, 2002, Kyu et al., 2013) this study found that the majority of care givers reported childhood illness episodes during every point of data collection in a longitudinal study. Longitudinal and qualitative study findings corroborate on the high prevalence of disease particularly with regard to commonest causes of under-five childhood morbidity: fever, diarrhoea, ARI symptoms, and general cough. In general, these findings are consistent with the child epidemiological profile for Malawi albeit with a notable exception that in this study ARI symptoms were more prevalent than diarrhoea whilst diarrhoea is reportedly more prevalent, nationally (NSO and IFC Macro 2011, GOM, 2013).

8.3 Responses to under-five childhood morbidity

This PhD research found that home management and care seeking from a biomedical health provider were the two most common forms of response to childhood illnesses. These two types of response to childhood morbidity fit within the health behaviours segment of the Andersen's health utilisation model and are influenced by various determinants. This section discusses these two responses to childhood morbidity.

Both longitudinal and qualitative findings corroborate on the fact that care givers undertake home management but the extent of such practice seemed divergent from the two methods of investigation. Longitudinal study findings noted that at most, 64% of care givers undertook home management for their sick under-five children. However, findings from FGDs and KII suggest that undertaking home management was an almost universal occurrence in the study setting and that it represented the first step of response for a sick

child even when health care would subsequently be sought from a biomedical health provider.

With regard to seeking care from a biomedical health provider, the longitudinal study found that on average, a small majority (61%) sought care. This shows that there is need for more efforts to improve under-five health service utilisation on the basis that higher rates of coverage of health services are required to reap optimal benefits of cost-effective child health interventions. For instance, Jones et al (2003) argued that universal coverage, defined as reaching 99% of children with effective interventions is warranted to significantly reduce childhood mortality in countries with highest under-five child mortality. Moreover, recent evidence indicates that coverage of cost-effective child health interventions remains suboptimal in many countries with the highest burden of under-five child mortality (Bryce et al., 2013 and Walker et al., 2013).

Furthermore, both the longitudinal and qualitative study findings demonstrated that health care for children is usually sought late. These findings render support to previous studies conducted in rural Malawi and elsewhere in sub-Sahara Africa which have demonstrated that health care for under-five children is usually not sought promptly (Chibwana et al., 2009, Getahun et al., 2011, Rutebemberwa et al., 2009). Thus this finding should reinforce the call for efforts for community sensitisation on benefits of timely care seeking.

Whilst both longitudinal and qualitative studies found that public health facilities are the most frequently used by care givers, divergent findings were noted pertaining to use of traditional medicine for sick children. The longitudinal study showed that use of traditional medicine was almost non-existent, reported in less than 1% of care seeking responses. However findings from the qualitative inquiry suggested that the practice may be more common than found in the longitudinal study. The differences in findings may be explained by two reasons. Firstly, qualitative inquiry focussed on a broader scope of child care practices hence greater likelihood of capturing incidents for which traditional medicine is used. For instance issues related to care of the umbilical stump for the new

born, treatment of fevers for which traditional aetiological explanations were perceived differently from biomedical ones as was the case with *mauka,* are cases in point. Secondly, the FGD environment in qualitative inquiry may have altered the inclination to provide socially desirable responses that individuals may have while responding to health related questions from an outsider in one to one interviews. In other words, FGDs may have created an environment for free discussion with peers present and the opportunity for a researcher to probe may have unearthed topical issues which lacked in longitudinal data collection.

8.4 Determinants of care seeking and timely care seeking for under-five child health services from a biomedical health provider

Various demand and supply side factors were found to influence care seeking and timely care seeking for under-five child health services. Demand side factors predominantly relate to population determinants of the Andersen's health utilisation model which include predisposing, enabling, and need factors. Supply side factors on the other hand encompass the external environment of the Andersen's model which include health system factors and other factors in the macro environment (Refer to chapter 4 especially figure 4.2).

8.4.1 Demand side determinants of care seeking and timely care seeking

Demand side factors influencing health care seeking and timely care seeking from a biomedical health provider were predominantly explored in the longitudinal study. The findings demonstrated that predisposing factors that significantly influenced care seeking included; child's age and care givers education. In addition, the qualitative study suggested that religious beliefs and traditional beliefs especially on the appropriateness of traditional medicine for some specific childhood symptoms, were relevant predisposing factors. None of the predisposing factors were found to be significantly associated with timely care seeking.

Slum residence was the only enabling factor that was significantly associated with both care seeking and timely care seeking from a biomedical health provider. Autonomy of

care giver is one of the enabling factors that other studies have found to have a significant positive impact on child health indicators (Fantahun et al., 2007, Kravdal 2003). However, both longitudinal and qualitative studies of this PhD research did not find evidence of its effect on health care seeking. In discussing this convergence of findings however, the differential approaches to defining autonomy should be acknowledged.

In the longitudinal study, autonomy of care giver was a composite measure emanating from four decision making related questions (see 5.2.6.1). Conversely, in the qualitative study autonomy of care giver was one-dimensional focussing only on who makes decisions to seek health care in the event of an illness episode in the family and whether such decision making dynamics affected care seeking. In all FGDs, care givers indicated that they have decision making power to take the sick child to the hospital even in the absence of their husbands. Indeed, while only 61% of care givers had a high autonomy score using the composite measure of autonomy, 91% indicated autonomous decision making pertaining to decisions to take a sick child or family member to hospital. Thus two consistent findings emerge from longitudinal and qualitative studies pertaining to autonomy. The first relates to an indication that care givers in urban slums are autonomous regarding decisions to take a sick child to the hospital. Secondly, while the ultimate measure of autonomy was different (composite in longitudinal versus one-dimensional in qualitative), the findings from the two methodologies are consistent with each other in that autonomy did not affect health care seeking.

The lack of significant effect of autonomy on care seeking and timely care seeking is counterintuitive. However it is important to note that autonomy was a composite variable that included three other decision making related questions in addition to decision making powers to take a sick child to a health facility. As cited earlier, the majority of care givers (91%) indicated that they have decision making powers to take a sick child to a health facility. This entails that a significant number of care givers who were classified as having low autonomy in the composite autonomy variable, had decision making powers to seek health care for their sick child. This may have presented a homogeneous group on

this dimension of autonomy thereby limiting meaningful comparison within the autonomy variable. This may suggest that other aspects in the autonomy composite variable may not have had an important effect on care seeking and timely care seeking from a biomedical health provider. Additionally, it may suggest that in an urban slum context where public health facilities are relatively close and are free at the point of delivery, other aspects such as financial autonomy, physical autonomy and decision making autonomy on other aspects other than health care seeking for a family member, are not highly considered.

Need factors found to significantly influence care seeking included severity of childhood morbidity, fever morbidity and home management of childhood illness whereas only home management significantly and negatively influenced timely care seeking. These particular aspects were not specifically explored in either qualitative or DCE methodologies.

It follows that of the potential determinants of care seeking and timely care seeking included in this PhD research, predisposing and need factors frequently emerge as important. The overall lack of evidence of importance of enabling factors such as socioeconomic status, care givers social capital, care givers autonomy, proximity to health services, in influencing care seeking and timely care seeking was unexpected. Nonetheless, the findings of this study are consistent with various studies in different contexts that did not find evidence of association between care seeking and enabling factors for under-five health service utilisation. For instance, socioeconomic status did not have effect on care seeking for under-five child health services in Sierra Leone (Diaz et al., 2013) and in India (Pillai et al., 2003). Autonomy of care givers was not significantly associated with care seeking in India (Kravdal, 2003).

8.4.2 Supply side factors influencing care seeking and timely care seeking

Both the qualitative and DCE studies explored health system factors of varying importance to care givers in decision making pertaining to use of a health provider. Qualitative findings on health system factors influencing care seeking decisions for under-

five child health services served two purposes. Firstly, they represented important findings in their own right from a rigorously undertaken analysis. Secondly, they were used as attributes in various steps of the DCE study. Effectively the two study methods were complementary in that qualitative study identified important health system factors in the context and the DCE sought to quantify their significance as individual factors but also relative to other health system factors insofar as under-five child health service utilisation was concerned.

Notably, except for distance to a health facility, all other health system factors noted in qualitative study and included in the DCE study were found to be significantly associated with preference for a health facility, denoting their importance in decision making to use a health facility. These factors include; availability of medicines and supplies; nature of examination of the child; attitude of health workers; waiting time; and cost of health care. Moreover in baseline of the longitudinal study, when care givers were asked what health system constituted quality under-five child health services, most of these factors (availability of medicines and supplies, good attitude of health worker, minimal waiting and convenient opening times) frequently emerged. This level of agreement is noteworthy as it entails robustness of the findings and justifies appropriateness of using mixed methods.

Further aspects of convergence of findings from two or all three study designs are worthy of exploring. In DCE, care givers derived greatest marginal utility in availability of medicines and supplies. Likewise in longitudinal study, availability of medicines and supplies represented the most frequently cited quality of care attribute cited by 92% of care givers at baseline. Similarly, as it emerged in FGDs, receiving medicines represented the ultimate point implying realised access to under-five child health services, and it was frequently cited in FGDs and KIIs.

Additionally, the DCE noted care givers aversion with increasing cost of health care and longer waiting times as reflected by their negative coefficients and high marginal Willingness To Pay (WTP) estimates for reduction in waiting time. This is further

supported by recurrence, in FGDs, of concerns and frustrations for long waiting times in public health facilities and the aversion for using private health facilities that charge user-fees.

While proximity to a health facility emerged as an important health system factor potentially influencing care seeking and timely care seeking especially among care givers from Ntandire in qualitative inquiry, there was no evidence of its association with health facility choice in a DCE study. Even in subgroup analysis by slum residence, distance was not significant among care givers from Ntandire. In the longitudinal study, distance only emerged as a statistically significant factor in an exploratory regression model suggesting late care seeking for care givers residing farther from a health facility, in baseline but lost significance in a final model and in subsequent longitudinal analysis models. The corroboration of quantitative evidence on the lack of significant effect of distance on care seeking for under-five children renders support to an earlier observation that even among the urban poor distance may not be an important barrier to care seeking in urban settings (KNUS, 2008).

Ultimately there appears to be noteworthy convergence of findings on the importance and relative importance of health system factors influencing care seeking decisions or broadly affecting access to under-five child health services. This affirms the significance of health care system factors in care seeking decisions as posited by Andersen's health utilisation model (Andersen, 1995). Collectively, the findings on significant influence of health system factors on care seeking decisions for under-five child health services use, is in agreement with studies elsewhere (Chuma et al., 2009, Kizito et al., 2012, Kruk et al., 2010, Kruk et al., 2009, Mangham et al., 2009).

In general, the causal pathways of influence of health system factors on care seeking decisions for under-five child health services may be explained by two related theoretical viewpoints. Firstly, Andersen's health utilisation model posits that there is a feedback loop that operates in health care utilisation in that health outcomes such as user satisfaction, evaluated and perceived health status in turn influence predisposing,

enabling and need factors which directly determine health service use (refer to figure 4.1) (Andersen, 1995). Admittedly, appropriate organisation of the health system would improve the factors noted in this study in many ways and attain quality provision of health services that are satisfying to consumers effectively eliciting subsequent demand. Conversely, persistent consumer dissatisfaction emanating from undesirable configuration of health system factors ultimately discourages health utilisation.

Secondly, there is extensive evidence from psychology literature that posits that previous experiences predict future behaviour (Furnham and Lovett, 2008). To this extent, care givers experience of persistent shortcomings of the health system will determine the next course of action when faced with a health service need for their under-five child. Often times this may have a consequence of further reduction in under-five child health utilisation. The broad implication therefore lies in the need to strengthen the health system so as to be responsive to people's expectations, which would arguably elicit demand for services and ultimately contribute to improving child health and survival.

8.5 Social determinants of child health and access to under-five child health services

The Andersen health utilisation model recognises the essence of the broader external environment constituting economic, politics and physical factors, in determining utilisation of health services. Findings from this PhD research noted the significance of the external environment in influencing decisions to use health services but also broadly influencing child health. This was predominantly explored in the qualitative study and detailed results and discussions are therefore presented in chapter 7. However, common findings emerged from longitudinal and qualitative studies in relation to social determinants of child health in an urban slum setting in Malawi.

For instance participants in FGDs in all settings and in KII indicated problems of inadequate sanitation, high levels of poverty, and overcrowding. Consistent with these, quantitative evidence from the longitudinal study affirmed that many households shared a single pit latrine, monthly household income and household assets data were indicative

of poverty, many household members lived in small houses with only one or two small bedrooms.

Poverty or lack of money was primarily expressed in the qualitative study as an important factor affecting access to child health services and this was cited differently in reference to either private or public health facilities. For private health facilities, it entailed all requirements of accessing child health care such as transport costs if required and cost of health care. On the other hand for public health facilities it was the cost of transport (if required) and the possibility of purchasing drugs from shops or private pharmacies when not available. Frequent use of public health facilities was cited in qualitative study as a default position due to aversion for user-fees in private health facilities. However, findings from the longitudinal study did not find evidence of significant association between household wealth and health care seeking.

8.6 Insights into application of Andersen's health utilisation model to this PhD research

In retrospect, the Andersen's health utilisation model has provided a useful explanation for most of the factors noted to significantly influence care seeking and timely care seeking of under-five child health services from a biomedical health provider. Evidently, a range of predisposing factors (age, care giver's education, beliefs), enabling factors (respective slum residence), need factors (perceived severity, fever morbidity and home management) and health care system factors (availability of medicines and supplies, nature of examination of the child, waiting time, attitude of health worker, cost of health care) were found to influence care seeking from the three study designs of this PhD research.

However, as cited earlier some factors that seem prominent in the model as determinants of health service use were not found to be associated with care seeking or timely care seeking in this PhD research. These factors include: socioeconomic status, social capital, autonomy, and travel time to a health facility. This reflects divergence in the findings of the PhD research study with theoretical propositions of what factors are important as

postulated in the Andersen health utilisation model. Nonetheless, this incongruity does not invalidate inclusion of these factors in the model as potential determinants of health service use. The model is intended for a broader context and the study was specific to a particular population group in a particular context. Evidently other studies in different contexts have found that some of these factors have predicted health service use. For example Subramanian et al. (2002) Taffa and Chepngeno, (2005) and Srivastava et al. (2009) found that socioeconomic status predicted use of under-five child health services. Likewise Ewing et al. (2011) and Rutebemberwa et al. (2009) noted that travel time determined care seeking for under-five child health services. Moreover it was beyond the scope of this research to test the theoretical validity of the model assumptions and application in the wider context.

In applying this study to the Andersen model, a specific challenge manifested pertaining to positioning some factors into respective components/segments of the model. Some factors could easily be classified into more than one component. To illustrate, availability of medicines, nature of examination, waiting time, distance to health facility, and attitude of health workers among others, arguably fit within the organisational factors that are conceptually encompassed in the broader enabling factors of the Andersen's model. However, the same factors also fall within the external environment and specifically the health system factors of the framework and can thus be appropriately labelled as supply side factors external to the individual caregiver that undertakes care seeking. This experience suggests that boundaries between enabling and external factors can be blurred hence the complex interaction of factors and allowing for fluidity in the application of the framework should be recognised.

The findings emerging from the three study designs of this PhD research affirm the importance of various factors at individual care giver or child, household, community and health system in determining care seeking and timely care seeking of under-five child health services. All these elements were captured by the model through its: (i) population determinants encompassing predisposing, enabling and need factors; (ii) external

environment comprising health care system and other external factors; and (iii) health outcome level factors comprising user satisfaction, perceived and evaluated health status (Andersen, 1995). Precisely, the model's theoretical propositions recognise the influence of both demand and supply determinants of health service use, effectively and comprehensively capturing the findings of this PhD research. This represents its particular strength in determining health service utilisation. On this basis, the Andersen's health utilisation model has had utility for its purpose of guiding selection of variables and providing potential causal pathways for determinants of health service use for this PhD research. It can therefore be argued that the model would be appropriate for use in similar studies.

Expectedly, the Andersen model was not useful in explaining findings pertaining to determinants of knowledge of child danger signs which was one of the dependent variables particularly for the longitudinal study. Obviously the model was not intended to explain such phenomenon. In essence, knowledge of danger signs was modelled as an enabling factor in health service use. In retrospect therefore, it can be argued that identification of another framework to provide a theoretical basis of the knowledge of child danger signs should have been more appropriate.

8.7 Methodological insights and challenges

The use of mixed methods research represents a significant strength of this PhD research as it allows drawing conclusions from different perspectives thereby broadening the scope of understanding of the phenomenon of interest (O'Cathain et al., 2007, Pluye et al., 2009). Furthermore, weaknesses of one method are compensated by strengths of the other effectively contributing to credibility of the findings. One example in this research is how the issues emerged in qualitative inquiry and strongly supported in the DCE and/or the longitudinal studies. In particular, utilising mixed methods in this PhD research provided a holistic view that encompassed demand and supply side determinants of care seeking of under-five child health services. Evidently, the longitudinal study predominantly provided demand side determinants including denoting temporal changes

in the three dependent variables of this PhD research study; the DCE study provided quantitative information on supply side determinants including ranking them in order of importance in a manner that mimics a real world environment with regard to health care seeking decision making; and the qualitative design provided exploratory information on demand and supply side determinants of care seeking, timely care seeking and various aspects of the study in ways that were not possible with the two quantitative designs. Therefore each study design had relative merits and contributed to specific aspects of the study while also complementing other designs on some study aspects.

Participation in all stages of qualitative inquiry allowed for a significant level of immersion into the data which subsequently assisted in analysis. Positionality, defined as the aspect of a researcher positioning him/herself and appreciating the bias and strengths that position may bring (Bowling, 2009) was therefore a critical consideration. In this context the involvement of another researcher (primary supervisor CD) in qualitative transcript coding and analysis, and denoting the inter-coder reliability as described in section 6.2.6 was therefore crucial in minimising potential bias by the PhD researcher.

Following up care givers in the slum contexts where there is overcrowding, with no addresses, hectic construction of houses and other structures, and in some cases difficulties with geographical land mark identification, was very complex and challenging. This, coupled with mobility of some slum residents, posed three additional challenges. Firstly, completion of data collection for respective data collection exercises (t0, t1 and t2) took longer than expected as each day's output per data collector was significantly reduced due to the time it took to locate care givers enrolled in the study. Secondly, the longer than anticipated duration of the study had implication of increasing the financial cost of conducting the study. Thirdly and arising from the first reason, is the fact that the time from the last date of a particular data collection (for example t0) and date of beginning the next (for example t1) could not be standard, (such as three months as intended). In view of this, to stick to the three to four months interval between data collection points at individual care giver level, data collection exercises followed the exact

previous pattern (meaning those care givers from whom data collection started in t0, were also the first to be sought in t1 and so on). This was more applicable between t0 and t1 probably due to the fact that by t2, data collectors were more familiar with the study settings and could easily navigate the areas.

In spite of the advantages of mixed methods cited earlier, in hindsight, there are some limitations which could have been counteracted if some aspects were arranged better. For instance, it would have been more appropriate and meaningful to undertake additional FGDs based on preliminary findings of longitudinal and DCE study designs to explore some aspects further. A particular example relates to two issues that emerged from longitudinal and DCE studies for which further exploration may have been warranted. These include: (i) why there was a significant increase in care givers who sought care timely during t2 and (ii) why distance to health facility did not seem to matter in findings of the DCE and longitudinal studies even when it emerged in initial qualitative discussions. Or why thorough examination was not significantly considered by some population subgroups in subgroup analysis of the DCE data.

8.8 Summary of the chapter

In synthesising findings from all three study designs, this chapter has demonstrated many areas in which the findings agree. However, there are areas in which divergent findings have been noted thereby providing different perspectives of various areas of interest. In particular, this chapter has noted that both supply and demand side factors are important in influencing decisions to seek health care for under-five children and whether to do so promptly or otherwise. The specific relevance of predisposing and need factors embedded in the population determinants, and health system factors embedded in the external environment segments of the Andersen health utilisation model have been discussed in relation to care seeking and timely care seeking.

It has also posited the appropriateness of the Andersen health utilisation model for this PhD research and any similar studies. Methodological insights and challenges in undertaking the three study designs of this PhD research have been cited.

CHAPTER 9

CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion

This PhD research represents the first robust research on under-five child health using mixed methods undertaken in an urban slum setting in Malawi. The study has shown that under-five child morbidity is high and care seeking from a biomedical health provider is suboptimal. Despite a significant temporal change with regard to timely care seeking towards the end of the longitudinal study, overall, care givers sought health care late. Home management of childhood illnesses represents one of the initial steps in responding to childhood illness episodes. However, it is imperative that care givers and communities are equipped with knowledge and skills for effective home management so that it does not compromise care seeking from biomedical providers when required.

This PhD research has found that technical quality attributes of health services such as availability of medicines and thorough examination, and non-technical quality attributes such as attitude of health workers play an important role in care seeking decisions. However, the urban health system is not adequately responsive to the expectations of the care givers as it is characterised by poor quality of health care dimensions constituting: inadequate essential medicines and supplies, limitations in clinical examination, negative attitudes of health workers, and long waiting times among other factors. There is urgent need to strengthen the child health system in urban settings so as to: provide for essential medicines and supplies; appropriate comprehensive examination of the sick child, reduction in waiting times, reduction of costs associated with health care seeking, and improving the professionalism of health workers. In this regard, Ministry of Health should prioritise the health system strengthening component of IMCI for urban settings and at national level.

There is no explicit focussed strategy to effectively address social determinants of child health despite the fact that they (social determinants) pervasively existent in urban slum settings. Efforts to address these determinants lack effective inter-sectoral collaboration

which is a prerequisite for their success. In the context of increasing urbanisation, the overarching implication of such shortcomings entails significant threats to losing gains made this far pertaining to child health. It is therefore imperative that in advancing inter-sectoral collaboration, various sectors such as those dealing with water, sanitation, refuse disposal, economic empowerment, and security work together as these concerted efforts have implications on health. Furthermore, ensuring healthy public policies (recognising implications of all public policies on health thereby designing all sector policies with positive health intentions) represents a worthwhile approach for the Government of Malawi. The report of the WHO's Commission on Social Determinants of Health; the UN-HABITAT's Participatory Slum Upgrading Programmes (PSUP) and the WHO's healthy settings movements are among the frameworks that would provide guidance in policy focus and implementation of strategies that would improve health of the population in general, and specifically for under-five children as a vulnerable population group in Malawi.

This thesis has acknowledged significant improvements made in child health indicators in Malawi such as reduction in under-five child mortality to the extent that the country may surpass its MDG 4 goal on indicator number two (reduce by two thirds, from the 1990 levels, under-five child mortality rate, by 2015). This notwithstanding, the essence of targeting evidence based interventions for children in urban slums should be acknowledged on the basis of vulnerability to ill health and inadequate access of health services posed by residence in slum conditions. This approach is worthwhile and consistent with previous assertions by child health experts that improvements in child health should not only be at aggregate levels but include vulnerable children. To achieve this, significant efforts such as ensuring access to health services are warranted among under-five children living in slum conditions.

It is imperative that stakeholders in child health policy and service delivery should act on policy amenable predictors of appropriate health care seeking (both care seeking from a biomedical provider and seeking it timely) and knowledge of child danger signs. These

factors relate to both demand and supply side and are explored in the recommendations section.

9.2 Recommendations

Based on the findings of the three study designs of this PhD research, various recommendations for child health policy, practice and research are suggested.

9.2.1 Recommendations for child health policy

i. *Child health policy and strategies should focus on child health in urban slums*. The high burden of childhood morbidity noted in this study necessitates the need for more efforts. Additionally, given that Malawi has one of the highest urbanisation rates globally and the manifestation of urban poverty through slums, it is imperative that child health policies and strategies should regard under-five children in urban slums as vulnerable needing targeted health interventions. Currently child health policy content only cites under-five children in hard-to-reach areas as vulnerable especially with regard to access to health services. This (targeting urban slum children as a vulnerable group) should be done to create impetus at implementation level and should be pursued by the Ministry of Health.

ii. *Integrate child health programmes at policy level*. There is need to integrate all existing child health programmes into one child health department. Thus IMCI, ARI/ETAT, PHI, EPI should be integrated into an overarching Department of Child health and have one strategic plan encompassing critical components of all programmes. This coordination has potential to minimise duplication of efforts, generate efficiency in use of resources, and minimise confusion at implementation level. Given the complexity of such a structural change and considering that the status quo has been in operation for more than a decade, it is imperative that the process involves all relevant actors. Furthermore, the implementation should be gradual to avoid disruption of some programmatic elements that are performing so well in the current vertical arrangement.

iii. *Design an effective inter-sectoral strategy that addresses child health and its determinants in a slum setting.* This is imperative as it is acknowledged that major determinants of child health fall outside the conventional realms of the health sector. In particular, there is need to take advantage of the interest and momentum expressed in efforts towards urban profiling exercises and the slum upgrading programme. The Ministry of Health should therefore take keen interest to advocate for efforts on child health determinants. Considering the involvement of several public sectors and actors to achieve this, it is recommended that such aspirations should be addressed at central government level. Therefore the Ministry of Health should advocate for inclusion of policy statements for improvements in health of the urban poor in overarching development strategies such as the Malawi Growth and Development Strategy (MGDS).

iv. *Increase resource allocation for child health in general and urban based health services in particular*. Given that the Malawi health system is generally under-funded and significant shortfalls have also been noted in child health financing, it is imperative that funding for child health is increased. Developing a health financing strategy for Malawi with alternative health financing options such as health insurance may be a starting point. On the basis of significant demographic pressures in the context of increasing urbanisation, there is also need to allocate additional resources for urban based health services delivery particularly targeting health facilities covering urban slums. There is need to develop or review resource allocation formula so that health resources are allocated according to health needs of a geographical area. This should be implemented at district level so that areas of greater health need such as urban slums are allocated proportionately more financial resources.

v. *Institute and/or revitalise governance structures to coordinate child health and associated determinants*. This study has noted that child health governance structures that were designed to coordinate inter-sectoral implementation of the Accelerated Child Survival and Development are either non-existent or where they

exist, do not function optimally. These structures should be revitalised or where appropriate new ones formulated. To the extent possible, there should be community representation in these structures. These structures should create a platform for discussion and stewarding a multi-sectoral response to child health. Thus if urban child health is prioritised in policy, these structures will be tasked to support such efforts. Furthermore, it is imperative that urban governance structures such as the City Council are strengthened so as to effectively deliver their functions. Strengthening capacity should include increased funding and developing human resource capacity in both numbers and expertise.

vi. *Develop performance based indicators for health facilities and provide incentives for good performance.* In order to respond to and sustain service use satisfaction, there is need to develop indicators that monitor provision of quality health care. These indicators should capture service user satisfaction attributes such as attitude of health workers. Well performing health facilities or health workers should then be incentivised as a means of positive reinforcement and ensuring sustainability.

9.2.2 Recommendations for child health practice

i. *Implement integrated Community Case Management (CCM) of common childhood illnesses in urban slum areas.* At present CCM is only implemented in hard-to-reach areas to surmount the distance barrier in accessing child health services. Ministry of Health should consider that this strategy should extend to urban slum areas. In this case it will be for a different contextual reason of decongesting health facilities in urban areas. Allowing Health Surveillance Assistants (HSAs) in urban slum areas to undertake basic management of common childhood conditions as their rural counterparts do, will reduce congestion at urban health centres effectively reducing long waiting times, and potentially contributing to more time spent with a health worker for those at a health facility.

ii. *Undertake child health promotion campaigns in urban slum areas to address the following key issues:* appropriate home management of childhood illnesses,

dangers of irrational antibiotic use including purchasing antibiotics from unauthorised local shops, prevention of childhood illnesses, advocating for timely care seeking from a biomedical health provider, health education on child danger signs especially those related to ARI and the need for prompt antibiotic treatment at a health facility, appropriate use of insecticide treated nets, and cleanliness of the household environment. Furthermore, there is need to ensure community participation in implementation of all health promotion activities for sustainability.

iii. *Strengthen urban based health centres to effectively provide child health services*. This should be done by improving availability of essential medicines and other supplies, increase number of health workers to reduce workload, frequent monitoring of health facilities and health workers to ensure adherence to clinical and professional standards. In addition, institutionalise clinical and health service audits and provide remedial action, based on the findings.

iv. *Train health workers in effective interpersonal and communication skills to improve health worker-patient relationship.* This can be done by organising in-service education sessions on effective patient management in health care settings. Ensuring that specific points on Continuing Professional Development (CPD) are allotted to such trainings will incentivise health workers to undertake such trainings. An assessment of the curriculum for undergraduate health training institutions for health professions should also be undertaken to devise ways of improving existent courses on effective communication, professional ethics and professionalism. This will help in effectively preparing students for good rapport building with their patients when they qualify.

v. *Establish and/or strengthen hospital governance structures that uphold rights of patients/clients*. Granted that governance structures such as hospital ombudsman are already provided for within MOH policy, it is imperative that such structures are established or where already existent, to be strengthened. This will afford the public to channel their complaints or concerns of their experiences with the health

system. Such complaints can therefore be followed by investigations and other remedial action such as disciplinary measures for health workers where appropriate. Effective functioning of such structures will contribute to responsiveness of the health system to peoples' expectations and have potential to generate public trust and elicit demand for child health services. Upon setting up such structures, a sustained community awareness initiative would be warranted on the roles, responsibilities and mode of operation of the respective governance structures.

vi. *Intensify supervision of health workers*. There is need for consistent supportive supervision of health workers by health managers and respective professional regulatory bodies such as the Medical Council of Malawi, Nurses and Midwives Council of Malawi and Pharmacy, Medicines and Poisons Board, so as to ensure adherence to professional ethos and clinical standards. It is imperative that appropriate feedback is provided to health workers pertaining to outcome of supervisions.

vii. *Devise strategies for appropriate health communication that encourages retention and use of information*. This study found that there was no association between receipt of health education on child danger signs and knowledge of child danger signs. Similarly, frequent contact with a health facility was not associated with knowledge of child danger signs. These two findings entail that either health workers do not frequently impart knowledge on child danger signs to care givers when they are in contact with them or that when such education sessions are undertaken the mode of content delivery is ineffective. This may relate to other aspects of health education content and topics not explored in this study. It is therefore imperative that innovative ways of health communication on knowledge of child danger signs (and by extension any child health topic) are devised and implemented so that care givers can retain the information and effectively use it.

9.2.3 Recommendations for child health research

i. *Undertake disaggregated analysis of child health among urban residents*. In the face of extensive evidence on increasing urbanisation in Malawi, the concept of urbanisation of poverty with its associated consequence of increases in slums, and the effects of slum residence on child health, it is important that urban health specific research is undertaken. In particular, research should transcend rural versus urban comparisons and gather evidence on the magnitude of intra-urban inequities in child health and highlight the specific health disadvantage of under-five children in urban slums. Furthermore, it is important that Health Management Information Systems (HMIS) at health facility and community (urban slums in this case) levels should be strengthened to achieve reliable analyses.

ii. *Establish an Urban Demographic and Health Surveillance Site (UDHSS).* Related to (i) above, an UDHSS could be established in a wider urban locality that includes slum settings to document vital health and demographic statistics at regular intervals. As a demographic and health surveillance site, it would provide a wealth of data that can be used to track various aspects of urban demographics and health. It would afford trend analysis of such evidence which would be crucial to inform policy and practice. However, the complexity of implementing this is acknowledged. Experiences from this study indicate that some sections of the urban slum population can be very mobile, both within and outside the slum areas. Such a surveillance system should be designed with such considerations in mind. The longitudinal nature of such a surveillance system would also specifically afford opportunity to observe trends in health indicators as urbanisation levels increase.

iii. *Undertake deliberate steps to strengthen capacity and provide incentives for child health research generally and urban health research in particular*. It is essential to generate considerable evidence base in a sustainable manner to inform policy and practice. To do this, deliberate steps need to be undertaken to strengthen urban health research. Creating an urban health research fund presents an example to

generate interest from health service researchers. Furthermore, existing research dissemination conferences in academic institutions and those undertaken at national level should be used to share results and drive child health policy.

iv. *Undertake periodic patient satisfaction surveys.* There is need to conduct periodic patient satisfaction surveys and use results to inform various aspects of under-five child health service improvements. The findings of such surveys can be linked to incentive schemes for health facilities and health workers as per child health policy recommendation vi above.

v. *Undertake public policy analyses to denote implications on health in general and under-five child health in particular.* Further to pursuit of the social determinants of child health agenda, Ministry of Health should advocate for healthy public policies (health in all public policies). A starting point in this effort is to undertake a policy analysis to review public policy content, context and implementation and denote respective implications on child health. This information can then be used to improve policy design and implementation in other sectors affecting health indicators.

9.2.4 Areas for further child health research

Further research should be undertaken in the following areas:

- Determining the child epidemiological profile in urban slum areas in Malawi's cities using health facility and community health data.
- Assess existence and magnitude of association between slum residence and impact level child health indicators such as child mortality and malnutrition in urban slums of Malawi.
- Investigation into expenditure on health in general and child health care in particular by households in urban slums and denoting existence and prevalence of catastrophic health expenditure (meaning where household expenditure on health results in impoverishment of the household).

- Assess the coverage rates of all proven cost-effective interventions addressing common childhood morbidities in urban slum settings in Malawi. Considering the significant implication of maternal health on child health, extend this investigation to reproductive and maternal health interventions in urban slum settings.
- Conduct ethnographic research to investigate the social dynamics of adopting various child care practices (positive or negative) in urban slum settings. For example, what determines uptake of traditional medicine in child care practices such as care of the umbilical stump.
- Investigate effectiveness and appropriateness of various home management practices from common childhood illnesses both quantitatively and qualitatively.
- Conduct experimental studies to determine the effect of knowledge of child danger signs on health care seeking and timely care seeking for under-five children.
- Conduct studies to determine effectiveness of various health communication strategies pertaining to improving child health literacy among care givers in general, and for care givers in urban slums in particular.

9.3 Concluding thoughts

In conclusion, this study has demonstrated a high burden of disease among the under-five children, a suboptimal health care seeding and a predominantly late health care seeking practice for care givers of under-five children in urban slums in Lilongwe, Malawi. The child health system is not responsive to the expectations of care givers and various barriers exist. This research contributes to the findings that some population groups in the urban areas may be facing poor health hence discourse should transcend urban versus rural comparisons. It has also contributed to demand and supply side determinants of under-five child health service use and further provided care giver valuations of health system factors. Various policy amenable factors have been identified to improve child health and survival in urban slum settings and broadly in Malawi.

In the final analysis, child health policy, practice and research in Malawi should be concerned about the health of under-five children in urban slums as a present problem but also as a way of averting complex health problems in the future resulting from inaction at present. As others have posited, it is important that current improvements in child health indicators should be manifested in all children. To what extent this is to be realised in Malawi, depends on how child health policy can recognise vulnerabilities of children in some population groups, explicitly target appropriate interventions, monitor and evaluate, and undertake sustained remedial action until improvements in child health and wellbeing are attained and sustained.

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APPENDIX I: ETHICAL APPROVAL LETTER FROM THE NATIONAL HEALTH SCIENCES RESEARCH AND ETHICS COMMITTEE

Telephone: + 265 789 400
Facsimile: + 265 789 431
e-mail doccentre@malawi.net
All Communications should be addressed to:
The Secretary for Health and Population

In reply please quote No. MED/4/36c

MINISTRY OF HEALTH
P.O. BOX 30377
LILONGWE 3
MALAWI

6th June, 2011

Edger Lungu
Ministry of Health

Dear Sir/Madam,

RE: Protocol # 895: " Child health and survival in urban slums: health care seeking behavior among care givers and the relative significance of health system factors in influencing care seeking decisions for child health services"

Thank you for the above titled proposal that you submitted to the National Health Sciences Research Committee (NHSRC) for review. Please be advised that the NHSRC has **reviewed** and **approved** your application to conduct the above titled study.

- **APPROVAL NUMBER** : **NHSRC # 895**
  The above details should be used on all correspondence, consent forms and documents as appropriate.
- **APPROVAL DATE** : **06/6/2011**
- **EXPIRATION DATE** :This approval expires **on 05/06/2012**
  After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the NHSRC secretariat should be submitted one month before the expiration date for continuing review.
- **SERIOUS ADVERSE EVENT REPORTING** :All serious problems having to do with subject safety must be reported to the National Health Sciences Research Committee within 10 working days using standard forms obtainable from the NHSRC Secretariat.
- **MODIFICATIONS**: Prior NHSRC approval using standard forms obtainable from the NHSRC Secretariat is required before implementing any changes in the Protocol (including changes in the consent documents). You may not use any other consent documents besides those approved by the NHSRC.
- **TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the NHSRC using standard forms obtainable from the NHSRC Secretariat.
- **QUESTIONS**: Please contact the NHSRC on Telephone No. (01) 724418, 0999218630 or by e-mail on moh@gmail.com
- **Other:**
  Please be reminded to send in copies of your final research results for our records as well as for the Health Research Database.

Kind regards from the NHSRC Secretariat.

.....

FOR CHAIRMAN, NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE

Telephone: + 265 789 400
Facsimile: + 265 789 431
e-mail doccentre@malawi.net
All Communications should be addressed to:
The Secretary for Health and Population



In reply please quote No. MED/4/36c
MINISTRY OF HEALTH
P.O. BOX 30377
LILONGWE 3
MALAWI

6th June, 2012

Edger Lungu
Ministry of Health

Dear Sir/Madam,

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FOR CHAIRMAN, NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE

PROMOTING THE ETHICAL CONDUCT OF RESEARCH
Executive Committee: *Dr.C Mwansambo (Chairman), Prof. E. Molynuex (Vice Chairperson)*
Registered with the USA Office for Human Research Protections (OHRP) as an International IRB
(IRB Number IRB00003905 FWA00005976)

APPENDIX II: ETHICAL APPROVAL LETTER FROM THE HEALTH POLICY AND MANAGEMENT-CENTRE FOR GLOBAL HEALTH RESEARCH AND ETHICS COMMITTEE



COLÁISTE NA TRÍONÓIDE, BAILE ÁTHA CLIATH | TRINITY COLLEGE D
Ollscoil Átha Cliath | The University of Dublin

Mr. Edgar Arnold Lungu,
c/o Ministry of Health,
Department of Planning and Policy,
(SWAP Secretariat),
PO Box 30377,
Lilongwe,
Malawi.

23rd August 2011

Re: Child Health and Survival in Urban Slums: Health seeking behaviour of care givers and the relative significance of health system factors in influencing care seeking decisions for child health services in Malawi

Application 27/2011/07

Dear Edgar,

Thank you for your submission of the above proposal to the HPM/CGH REC.

The REC has given ethical approval to the proposed study.

Yours sincereiy,

Chair Normand

Prof. Charles Normand
Chair of the HPM/CGH REC

APPENDIX III: PARTICIPANT INFORMATION LEAFLET

Study Title: CHILD HEALTH AND SURVIVAL IN URBAN SLUMS IN MALAWI: HEALTH SEEKING PRACTICES OF CARE GIVERS AND THE RELATIVE SIGNIFICANCE OF HEALTH SYSTEM FACTORS IN INFLUENCING CARE SEEKING DECISIONS FOR CHILD HEALTH SERVICES.

Name of Investigator: Edgar Arnold Lungu

Supervisors: Dr Catherine Darker, Dr Regien Biesma, Dr Maureen Chirwa

This study is conducted in fulfilment of the PhD in Health Systems Research

1. **Research purpose and procedures**: This research study is aimed at investigating health care seeking practices for under-five child health services including the relative significance of health system factors in influencing care seeking decisions of care givers in urban slums in Lilongwe. Ultimately the study will document their implications for child health and survival in urban slums of Malawi.

   Research participants include children under the age of five years and their care givers in the three areas in Lilongwe city. Participation in the study will be upon giving consent after reading or being explained to about the entire study. Consenting participants will be requested to respond to predetermined questions pertaining to the research through a face to face interview using a questionnaire. The study involves three approaches. The first approach of the study will involve following up the research participants for a period of nine to twelve months with data on care seeking collected at three to four months intervals.

   The second approach of the study involves two related parts. The first part involves discussions with groups of women in matters pertaining to under-five child health in the selected areas. Specific focus will be on health seeking practices and perceived influence of the health system factors in influencing utilization of child health services and on prevalent child care practices in study settings. The second part involves discussions with health workers and policy makers on aspects of organisation of health service delivery, policy and health care seeking practices. Discussions in all parts of this approach will be tape recorded for purposes of ethics, efficiency in data collection and analysis thereafter. Participants of the focus group discussions and key informant interviews will have freedom to access the audio recordings if they wish.

The third approach of the study involves care givers responding to a different set of questions. In this approach, participants will be presented with hypothetical scenarios comprising characteristics of a health system from which they will be asked to choose where care would be sought for their sick child.

2. **Research study sites**: The study will be conducted in Senti, Mgona and Ntandire in Lilongwe
3. **Risks and discomforts**: No risk or any form of discomfort is anticipated for this study

4. **Potential benefits**: There are no direct individual benefits of participating in the study. However, it is anticipated that the findings of the study will influence positive changes in health policy, planning and practice with regard to child health in disadvantaged urban areas.
5. **Provisions for confidentiality:** In line with good research practice through adherence to research ethical principles, this study will ensure confidentiality of information to be solicited in the process of the research. Information collected and stored in electronic form will be encrypted and will be password protected. Hard copies and recorders containing participants' information will be kept in secure cabins under lock, only accessible to the research team. All support staff on the research team such as data collectors and data entry clerks will sign confidentiality agreements as part of contractual involvement in the research.

6. **Voluntary participation and the right to discontinue participation without penalty:** Participation in this research is entirely voluntary. Refusal to participate in this research will not result in any form of penalty or withholding of any sort of benefits currently being enjoyed or any rights thereof. In the same way, research participants have the freedom to withdraw at any point in time without giving a reason and no form of penalty will be inflicted on them.

7. **Permissions:** The investigator has obtained permission to conduct the study from Department of Health Services of Lilongwe City Assembly. The investigator has also obtained ethical approval from the Health Policy and Management-Centre for Global Health Research Ethics Committee at Trinity College Dublin, as well as from the National Health Sciences Research Committee in Malawi.

8. **Contacts for additional information:** If you have any questions relating to this study or your rights as a participant in this research feel free to ask or feel free to contact the principal investigator, Edgar Arnold Lungu on +265 991285 678.

APPENDIX IV: INFORMED CONSENT FORM

STUDY TITLE: CHILD HEALTH AND SURVIVAL IN URBAN SLUMS IN MALAWI: HEALTH SEEKING BEHAVIOURS BY CARE GIVERS AND THE RELATIVE SIGNIFICANCE OF HEALTH SYSTEM FACTORS IN INFLUENCING CARE SEEKING DECISIONS FOR CHILD HEALTH SERVICES.

PRINCIPAL INVESTIGATOR: Edgar Arnold Lungu

DECLARATION:

I have read, or.....has read to me, the information leaflet for this research project and I understand the contents. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction. I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights. I understand that I may withdraw from the study at any time.

PARTICIPANT'S NAME: .....

CONTACT DETAILS: .....

PARTICIPANT'S SIGNATURE: .....

Date:.....

Statement of investigator's (or data collector) responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

INVESTIGATOR'S SIGNATURE:.....Date:.....

APPENDIX V: HEALTH CARE SEEKING BEHAVIOUR QUESTIONNAIRE – BASELINE AND (FOLLOW UP FROM SECTION 9)

Questionnaire Code Number / ___

Strictly confidential information

SECTION 1: IDENTIFICATION INFORMATION OF THE QUESTIONNAIRE TO BE COMPLETED BY THE INTERVIEWER

Identification information	Name
A1. Urban slum's Name	*Interviewer: Enter name of the slum/* ----------
A2. Traditional Authority	*Interviewer: Enter name of T/A/* ----------
A3. Date of Interview	*Interviewer* *Enter actual date of interview*_____
A.5 Interviewer	*Interviewer: Enter your name/*----------

SECTION 2

INFORMED CONSENT: Hello. My name is *Edgar Lungu (interviewers name)*. We are carrying out a survey on health seeking behaviour for child health services among the urban slum population. Care givers for children are influenced by various factors to seek health care from different providers for their sick child. We need to find out this and related information pertaining to child health. This research study is for academic purposes leading to a PhD. There are no direct benefits for your participation in this research. However, the information you provide is important to inform stakeholders dealing in child health to improve child health and survival service delivery particularly in urban slums settings.

I am interested to ask the primary care taker of the Under five child in this household, questions pertaining to the health and care of the child. The nature of the study is such that we will ask you questions this time and we will follow up with other questions after four months and then finally the third time after four months from the second visit.Your participation in this survey is entirely voluntary and you may refuse to answer any or all questions. You can also withdraw from the study at any point you feel like. Any information collected will be kept strictly confidential, only accessible to those involved in conducting the research. Your name will not be recorded to conceal your identity. If you agree to participate in the study, I will ask you to sign a consent form and then proceed to ask you a set of questions which should take about an hour at most. Appropriate procedures to conduct research have been followed and the National Health Sciences Research Committee has approved its procedure. They can be contacted for verification. Should you require further information pertaining to the study or your rights as a participant in this study, feel free to call the principal investigator on 0991285678. Do you have any questions to ask me at this point? Are you willing to participate in this study?

YES _____ NO_____ (tick as appropriate)

SECTION 3: CHARACTERISTICS OF THE RESPONDENT

General Instruction: ***Interviewer, please enter responses in codes (as coded in the answers column) on the column on the right unless stated otherwise in the instructions of specific questions***

SECTION 1: HOUSEHOLD BACKGROUND INFORMATION

No.	QUESTIONS	ANSWERS	RESPONSE (IN CODES)
001	Sex of respondent (**Observe and record. Do not ask)**	***1*** 1. Male 2. Female	_____
002	Age of respondent in completed years?	*2* ***3*** *Interviewer: Please enter age in years on the right.*	
003	Tribe of respondent	1. Chewa 2. Tumbuka 3. Yao 4. Ngoni 5. Sena 6. Lomwe 7. Nkhonde 8. Tonga	
004	What is your marital status?	1. Never married 2. Married 3. Divorced or separated 4. Widowed	_____
005	What is the highest level of education that you successfully completed?	1. Never attended school 2. Adult literacy 3. Pre-school 4. Primary Class 1 to 4 5. Primary Class 5 to 8 6. Secondary 7. University 8. Other tertiary	_____
006	What is your main activity / occupation?	**1**Government employee at professional/managerial level **2** Government employee lower levels **3** Private sector employee at professional/managerial level **4** Private sector employee at lower levels **5** Farm/estate employee regular **6** Casual work **7** Self-employed farming/fishing **8** Own shop/workshop **9** Produce/collect goods to sell on market **10** Retired/pensioned (receiving benefits) **11** Student **12** No activity **13** Other (specify)	_____

No.	QUESTIONS	ANSWERS	RESPONSE (IN CODES)
07	What is your RELATIONSHIP with the head of the household	**1** Head of Household **2** Wife or Husband **3** Son or Daughter **4** Sister/Brother **5** Father or Mother **6** Uncle or Aunt **7** Son or Daughter in-law **8** Grandchild **9** Parent in-law **10** Nephew or Niece **11** Adopted/Foster/ Stepchild **12** Not related **13** Other (specify)	_____
08	What is the highest level of education for the head of the household	1. Never attended school 2. Adult literacy 3. Pre-school 4. Primary Class 1 to 4 5. Primary Class 5 to 8 6. Secondary *7.* University *8.* Other tertiary	
09	What is the main activity / occupation of the head of the household	**1** Government employee at professional/managerial level **2** Government employee lower levels **3** Private sector employee at professional/managerial level **4** Private sector employee at lower levels **5** Farm/estate employee regular **6** Casual work **7** Self-employed farming/fishing **8** Own shop/workshop **9** Produce/collect goods to sell on market **10** Retired/pensioned (receiving benefits) **11** Student **12** No activity **13** Other (specify)	_____

SECTION 4: ASSET QUESTIONS

No.	QUESTIONS	ANSWERS	RESPONSE IN CODES
10	What are the main walls of your dwelling house made of?	**1** Poles and grass **2.** Poles and mud **3.** Kimberly bricks-no paint **4.** Kimberly bricks-painted **5.** Burnt bricks/burnt Kimberly bricks **6** Un burnt / mud bricks ***4 7. Other (specify _____***	_____

No.	QUESTIONS	ANSWERS	RESPONSE IN CODES
11	What is the main material of the roof of your dwelling house?	**1.** Grass thatched roof **2.** Thatched with plastic and grass **3.** Tiles **4.** Iron sheets **5.** Other (specify)_____	_____
12	How many rooms (excluding kitchen, toilet corridors and bathroom) are in your dwelling?	***5*** *Interviewer: Please enter number of rooms in column on right.*	_____
13	How many people live in this household	*6* *Interviewer: Please enter number of people in the column on the right*	_____
14	How many of the following does the household own? Circle and write number *Multiple answers acceptable*	1 Cattle: ..... 2 Goats:..... 3 Chickens:..... 4 Pigs:..... 5 Sheep:..... 6 Other (specify):.....	_____

No.	QUESTIONS	ANSWERS	RESPONSE IN CODES
15	Does your household own any of the following: (Insert whichever code is applicable)	1 Radio? 2 Bicycle? 3 Motorcycle? 4 Oxcart? 5 Private car? 6 TV/Video? 7 Telephone 8 Refrigerator? 9 Satellite dish? 10 Maize mill? 11 Farming mechanical equipment? Specify.....	_____
16	Is there functional electricity in the household?	1. Yes 2. No	_____
17	Do you have a house of your own	1. Yes 2. No	
18	What is the main source of energy for cooking in your household	1. Electricity 2. Gas 3. Paraffin 4. Wood coal/charcoal 5. Wood, straw 6. Other (indicate) _____	_____
19	Does your household have a toilet?	1. Yes 2. No	
20	What kind of toilet does your household use?	1. Flush toilet 2. Basic latrine 3. Improved latrine 4. No toilets	

		5. Other (indicate)/ _____	
21	How many households use this toilet with you	1. Only our household 2. Two households 3. Three households 4. Four households 5. Five households 6. Other (Specify)	

SECTION 5: SOCIAL CAPITAL QUESTIONS

I will now read out five statements in which you will be required to answer Yes if the statement is applicable to you and No if it is not applicable to you

No.	QUESTIONS	ANSWERS	RESPONSE IN CODES
22	I can easily borrow money from relatives or friends in case of need?	0. No 1. Yes	
23	I am a member or leader of a social support group? *Interviewer, please clarify that this is in reference to any group offering social support e.g community revolving funds, village women's social welfare etc*	0. No 1. Yes	_____
24	I am a member of a community organization?	0. No 1. Yes	
25	I trust people and believe they are the ones that can offer help around me if need arises	0. No 1. Yes	
26	I think associations with people can hurt me or my family so I prefer doing things alone	0. Yes 1. No	_____

SECTION 6: QUESTIONS ON CARE GIVERS AUTONOMY

No.	QUESTIONS	ANSWERS	GO TO:	CODES
27	Who makes big decisions in the family (*Interviewer please clarify that big decisions such as place of residence, constructing a house, buy, sell land or renting land or house etc)*	0. Husband alone 7 1. Decisions are made together (husband and wife)/ or wife can make decisions if husband is away *Note: In households where care taker is not the mother of the child, the husband response should correspond with any head of household and wife should mean care taker but please specify*		_____
28	Who makes routine decisions of the household such as buying and/or selling food items and day to day activities of the household	0. Husband alone 8 1. Decisions are made together (husband and wife) or wife can make decisions if husband is away		_____
29	Who makes decisions pertaining to visiting a family member	0. Husband alone 9 1. Decisions are made together (husband and wife) or wife can make decisions if husband is away		_____
30	Who makes decisions pertaining to take a sick child or any family member to the hospital or any other health care provider	0. Husband alone 10 1. Decisions are made together (husband and wife) or wife can make decisions if husband is away		_____

SECTION 7: INFORMATION ABOUT CHILD AND CHILD CARE PRACTICES

No.	QUESTIONS	ANSWERS	GO TO :	CODES
31	How many under-five children live in this household?	*11 Interviewer: Please enter number of U-5 children in the column on the right*	*12*	___
32	How old is _____*(name of sampled U-5 child)*	*Interviewer: Enter age in months the column on the right*		
33	According to birth order of your children, what number is (*child's name)* i.e. First, second, third born...etc?	1 . Fist born 2. Second born 3. Third born 4. Fourth born 5. Fifth born 6. Sixth born 7. Other (Specify)		
34	What is your relationship with the child	1 Close relative 8. Mother 9. Father 10. Grandparent 11. Sibling 12. House maid 13. Others (specify)		
35	How many children has the mother of the child given birth to?	*Interviewer please enter the mother's parity in the column on the right*		
36	Are all your children alive	1. Yes 2. No		
37	How old is the person who usually takes care of the child?	*Please enter age in completed years in the column on the right*		_____**Years**
38	Was _____(*child's name)* given a birth certificate	1 Yes 2 No		
39	Does the_____*(child's name)* have a growth monitoring card? Or a health passport? A card like this or a child health pass book like this?	1 Yes 2 No *Interviewer: Please show the card and book to the child's care taker as a reference . Also specify if has a card or health pass book or both in the column on the right*		
40	Has the child received Vitamin A in the past 6 months *Interviewer: Describe how Vitamin A looks like and check both child card and health passport to verify response.*	1 Yes 2 No		
41	Is (*child's name)* immunisation status up to date?	1 Yes 2 No *Interviewer, please verify the response by checking the child health passport and immunisation schedule*		

42	Where did the child receive the last vaccination?	1 Government Health Center 2 Government Community Hospital 3 Government Hospital 4 Government Central Hospital 5 CHAM – Health Center 6 CHAM – Community Hospital 7 CHAM – Hospital 8 Government facility community outreach U-5 clinic 9 CHAM health facility community outreach U-5 clinic 10 Private clinic 11 Health Surveillance Assistant 12 Volunteer 13 Don't know? 14 Other (Specify)		

SECTION 8: BREAST FEEDING AND CHILD FEEDING PRACTICES

No.	QUESTIONS	ANSWERS	GO TO :	CODES
43	Has (*child's name)* ever been breast fed	1 Yes 2 No	*13*	____
44	Did you feed the child with colostrum	1 Yes 2 No		
45	At what age in months did you start giving (*child's name)* any food or drink in addition to breast milk?	*Interviewer: Enter age in months in the column on the right*		
46	Why did you start giving _____(*child's name)* complementary feed at that age?	1 Mother did not have enough breast milk 2. Mother not able to breast feed due to sore nipple 3. Mother has been in poor health 4. Mother protecting child from HIV transmission through breast milk 5. Mother was working 6. Age of child is greater than six months 7. Mother became pregnant 8. Other (specify)		
47	Is (*child's name)* still breast feeding?	1 Yes 2 No	If Yes go to 51	
48	At what age in months did (*child's name)* stop breast feeding	*Interviewer: Enter age in months in the column on the right*		
49	Have you ever given *(child's name)* substitute for breast milk? *Interviewer: please explain that this refers to giving child another type of feeding in place of breast milk*	1 Yes 2 No 3 Dont remember	Instruction: Please note that this question relates to substitute for breast milk meaning instead of breast milk, care giver provided something else. It is different from 45 which is focussing on complementary feeding, so explain this way to the care giver	_____

50	Why did you give _____(*child's name)* substitute for breast milk	1. Mother did not have enough breast milk 2. Mother not able to breast feed due to sore nipple 3. Mother has been in poor health 4. Mother protecting child from HIV transmission through breast milk 5. Mother was working 6. Age of child is greater than six months 7. Mother became pregnant 8. Other (specify)		

SECTION 9: CARE OF THE SICK CHILD: HEALTH CARE SEEKING BEHAVIOUR

No.	QUESTIONS	ANSWERS	GO TO :	CODES
51	In the last three months, that is from today, has (*Childs name)* had any illness or health problem?	1 Yes 2 No 14 3 Dont remember	*15 If No, still ask Question 54 just to verify this response*	_____
52	Is the illness episode in the health passport	1. Yes 2. No		
53	Has there been any illness episode in the past two weeks?	1. Yes 2. No		
54	Please tell me if (*Childs name)* had any of the following symptoms in the last three months including today	1. Fever 2. Convulsions 3. Cough 4. Cough and fast breathing 5. Diarrhoea 6. Blood stool 7. Generalised skin rash 8. Redness of eyes 9. Not able to drink or breast feed 10. Swollen limbs 11. Vomiting everything 12. Unconscious 13. Injury 14. Burns 15. Other (Specify)	*Read listed symptoms and illnesses below and circle codes if response is yes, leaving it blank if no* ***If child did not suffer from any of these, go to 86***	
55	Based on your perception of the illness, how severe was this childhood illness	1 Not serious – not worried 2 Moderate – not worried 3 Severe 4 Very severe		
56	What was the duration of this illness episode (from onset of symptoms to illness outcome e.g full recovery)	1. One day 2. Two days 3. Three days 4. Three days 5. Four days 6. Five days 7. More than five days		

57	Did you start treating _____(*Childs name)* at home?	1. Yes 2. No ***3*** Dont remember	If No, go to 61	
58	How long after you noticed (*child's name)* did you provide the home treatment?	1 Same day 2 Next day 3 After a day 4 After two days 5 Other (Specify)		
59	What home treatment did you give?	1 Western medicine 2 Herbal medicine 2. Did nothing		
60	Where did you get the medicine you gave?	1 Neighbour / friend 2 Relative 3. Shop / Store 4. Health facility 5. Community health worker 6. Pharmacy / drug shop 7. Traditional healer 8. Other (Specify)		
61	Did you seek advice or treatment outside the home, particularly the hospital or traditional healer etc	16 Yes 17 No 18 Dont remember	**If No, Go to 62 and if Yes skip 62**	
62	What were the reasons for not seeking outside help for this childhood illness episode	1. The condition was not that severe 2. Did not have money for cost of care such as transport etc 3. It is too far to walk 4. My husband was away so was waiting for him to decide 5. I was advised by peers / elders/ to wait 6. I did not know that the condition was severe 7. Drugs are usually not available at health facility so just thought no point of going 8. Attitude of health workers is so bad I couldn't imagine going to face them 9. Other (Specify)	**After this question, skip to 86**	
63	How long did it take you after recognising that *(child's name)* did you take before seeking care outside the home?	1. Same day 2. Next day 3. After a day 4. After two days 5. Dont remember 6. Other (specify)		
64	Is there any reason why it took you the time you have indicated before taking _____(child's	1. The condition was not that severe 2. Did not have money for transport and paying bills	**Interviewer: multiple responses are acceptable**	

	name) for treatment elsewhere other than home	3. I did not know that the condition was severe enough 4. It is very far 5. My husband was away so I could not make the decision alone 6. I was advised by peers and /or elders within the community to wair 7. Other (Specify)		
65	When *(childs name)* was taken to provider outside the home, who made the decision that the child should be taken there?	1. Child's mother 2. Child's father 3. Both child's mother and father 4. Other relative 5. Community member 6. Village health worker / Health Surveillance Assistant 7. Other (specify)		
66	Who took (*child's name)* to the said provider	1. Child's mother 2. Child's father 3. Both child's mother and father 4. Other relative 5. Community member 6. Village health worker / Health Surveillance Assistant 7. Other (specify)		
67	Which provider did you take (*child's name)* to in order to get help on his/her illness	1 Government Health Center 2 Government Community Hospital 3 Government Hospital 4 Government central hospital 5 CHAM – Health Center 6 CHAM – Community Hospital 7 CHAM – Hospital 8 Government facility community outreach U-5 clinic 9 CHAM health facility community outreach U-5 clinic 10 Private clinic 11 Traditional healer 12 Health Surveillance Assistant 13 Volunteer 14 Don't know? 15 Other (Specify)		
68	When the *(child's name)* was taken to this provider, how long did it take you to travel and reach that place?	***Interviewer: enter time response in minutes in the column on the right***		
69	What was the means of transport to go to this provider	1. Walked 2. Rode a bicycle 3. Rode a minibus / taxi 4. Was taken by ambulance		

70	Did you pay for transport to get to the provider?	1. Yes 2. No 3. Cant remember	**If No or cant remember, skip 71**	
71	How much did you pay for your transport to the provider	*Interviewer: please enter the amount in MK in a column on the right*		
72	Did you pay for treatment at the provider where you went with *(child's name)*	1. Yes 2. No 3. Cant remember	**If No or cant remember, skip 73**	
73	How much did you pay for treatment at the provider?	***Interviewer: please enter amount in MK in a column on the right***		
74	When you sought services from this provider, did the health worker advise you how to treat *(child's name)* **Interviewer: *please read each item and circle the appropriate code if response is yes.***	1. Duration of taking medicines 2. When to return for review of child 3. What to do if child does not get better 4. Give more fluids 5. Increase fluids after recovery 6. Continue to breast feed child even when child is ill	***Multiple responses are acceptable***	
75	Were you provided with instructions or counselling on any of the following when you sought care from a health provider during this time ?	1. Duration of taking drugs 2. When to return for review 3. What to do if child does not get better 4. Give more fluids 5. Increase fluids after recovery 6. Continue to breast feed child even when child is ill	***Multiple responses are acceptable***	
76	Did you take the child back to the health facility for a follow up visit?	1. Yes 2. No 3. Cant remember	**If Yes, go to78**	
77	What prevented you from taking *(child's name)* for a follow up visit ? *Interviewer: multiple responses are acceptable*	**1.** Was not told to go for follow up visit **2.** Could not afford the extra cost **3.** Did not have the time **4.** Did not have the household authority to make this decision **5.** Did not believe that follow up was necessary **6.** Have not yet taken child to hospital but intend to		
78	Did you have to go to another provider, having already visited the first, for treatment of this illness of *(child's name)*	1. Yes 2. No 3. Cant remember	**Interviewer: if No or cant remember go to 81**	
79	Which provider did you take *(child's name)* to next?	1 Government Health Center 2 Government Community Hospital 3 Government Hospital 4 Government Central Hospital 5 CHAM – Health Center 6 CHAM – Community Hospital 7 CHAM – Hospital		

		8 Government facility community outreach U-5 clinic 9 CHAM health facility community outreach U-5 clinic 10 Private clinic 11 Traditional healer 12 Health Surveillance Assistant 13 Volunteer 15 Other (Specify)		
80	Why did you decide to go to another provider?	1. Advised by health worker as referral 2. Child not cured 3. Medication was too expensive 4. Instructions for treatment were too difficult to follow 5. Not satisfied with the service offered at the other facility 6. Others (Specify)		
81	Were you referred to another provider of health services by health worker / provider where you sought care?	1. Yes 2. No 3. Cant remember	**IF No or cant remember, go to 86**	
82	Where were you referred to ?	1 Government Health Center 2 Government Community Hospital 3 Government Hospital 4 Government Central Hospital 5 CHAM – Health Center 6 CHAM – Community Hospital 7 CHAM – Hospital 8 Government facility community outreach U-5 clinic 9 CHAM health facility community outreach U-5 clinic 10 Private clinic 11 Traditional healer 12 Health Surveillance Assistant 13 Volunteer 15 Other (Specify)		
83	Did you actually go to the provider whom you were referred to?	1. Yes 2. No 3. Cant remember		
84	After how long did you take *(child's name)* for referral?	1. Same day 2. Next day 3. After two days 4. Not at all		
85	What prevented or delayed you in attending to the referral as per advice?	1. Could not afford the extra cost 2. Did not have the time 3. Did not have the household authority to make this decision 4. Did not believe that follow up was necessary 5. Have not yet taken child to hospital but intend to		

		6. Child became well before referral 7. Other (Specify)		

SECTION 10: KNOWLEDGE OF HOME MANAGEMENT FOR COMMON CHILDHOOD ILLNESSES AND DANGER SIGNS FOR CHILD HEALTH

No.	QUESTIONS	ANSWERS	GO TO :	CODES
86	Have you ever received advice on how to properly manage a sick child at home?	1 Yes 2 No 3 Dont remember	*19*	
87	Have you ever been given advice on home management for the following childhood illnesses?	1. Fever 2. Cough with difficulties in breathing 3. Diarrhoea	***Interviewer: read the illnesses on the answer column and circle the response. Multiple responses are acceptable***	
88	From whom did you receive this advice?	1. Health worker from a facility 2. Women group meeting 3. Community health worker 4. Community leader 5. Village health talk 6. Radio/ papers 7. Drama, songs 8. Community health worker / Health Surveillance Assistant (HSA) 9. Other (specify)	***Multiple responses acceptable***	
89	Can you tell me how you would manage the following childhood illnesses at home?	1. Fever 2. Coughing with difficulties in breathing 3. Diarrhoea	***Interviewer: read out the following childhood illnesses and document management of each in the column on the right or a separate paper to be attached to the questionnaire***	
90	Have you ever received information/advice on the signs that show that a child is very sick and requires urgent treatment at the health facility? ***Interviewer remember this is referring to danger signs***	1 . Yes 2 . No 3 Cant remember	**If No got to 92**	
91	From whom did you receive this advice?	1. Health worker from a facility 2. Women group meeting 3. Community health worker 4. Community leader 5. Village health talk 6. Radio/ papers 7. Drama, songs 8. Community health worker / Health 9. Surveillance Assistant (HSA) 10. Other (specify)Neighbour / friend		

92	What can you tell me are the signs that show that a child is very sick requiring urgent treatment at a health facility? ***Interviewer: multiple responses are acceptable***	1. Vomiting everything ingested 2. Unable to drink or breast feed 3. Unconscious or coma 4. Extremely weak 5. Passes little and dark urine 6. Sunken eyes 7. None 8. Other (specify)		
93	What signs can you tell me show that the child with diarrhoea has lost lots of body fluid?	1. Sunken eyes 2. Sunken fontanel 3. Inelastic skin 4. Very dry lips 5. Passes little and very dark urine 6. Other (specify)	***Multiple responses acceptable***	
94	Are there childhood illnesses or conditions in this community that you think might be better managed by others not associated with a health facility / western medicine ?	1. Yes 2. No 3. Dont know	**If No go to 96**	
95	What are these illnesses?	1. Flu, common cold 2. Anaemia 3. Eye and ear infections 4. Fever 5. Diarrhoea 6. Convulsions 7. Pneumonia/difficulty with breathing 8. Malaria 9. Malnutrition 10. Other (specify)	***Multiple responses acceptable***	
96	Has the child been admitted over the past three months	1. Yes 2. No	***If No go to 101***	
97	What childhood illness was the cause of admission?	1. Fever 2. Convulsions 3. Cough 4. Difficult breathing 5. Diarrhoea 6. Blood stool 7. Generalised skin rash 8. Redness of eyes 9. Not able to drink or breast feed 10. Vomiting everything 11. Unconscious 12. Cough and difficulties in breathing 13. Other (Specify)		
98	What was the duration of admission (in days)	1. One day 2. Two days		

		3. Three days 4. Three days 5. Four days 6. Five days 7. More than five days		
99	Where was .....(name of the child) admitted	1. Government Health Center 2. Government Community Hospital 3. Government District Hospital 4. Government Central Hospital 5. CHAM – Health Center **6.** CHAM – Community Hospital 7. CHAM – Hospital 8. Government facility community outreach U-5 clinic 9. CHAM health facility community outreach U-5 clinic 10. Private clinic 11. Traditional healer 12. Health Surveillance Assistant 13. Volunteer 14. Don't know? 15. Other (Specify		
100	Were you educated or counselled on childhood danger signs upon discharge or during your stay in hospital?	1. Yes 2. No		

SEC TION 11: HEALTH SERVICE AVAILABILITY

No.	QUESTIONS	ANSWERS	GO TO :	CODES
101	Is there someone in the community you regularly consult with regards to childhood illnesses?	1. Yes 2. No 3. Dont know	*20* *If No go to 103*	_____
102	Who do you see in the community for childhood illnesses and conditions?	1. Trained health worker 2. Relative 3. Neighbour or friend 4. Community health worker 5. Traditional birth attendant 6. Traditional healer 7. Religious leader 8. Other (specify)	*21* Multiple responses acceptable	
103	Do you have Village Health Clinics in your community	1. Yes 2. No 3. Don't know	**22** **If No or Don't know, go to 105**	

104	How often are Village Health Clinics conducted in your area?	1. Once every two weeks 2. Once a month 3. Once in two months 4. Once in three months 5. Once in four months 6. Once in five months 7. Once in six months 8. Other (specify)	23	
105	Do you have community outreach clinics offering Under five child health services around your community?	1. Yes 2. No 3. Dont know Fever	***If No or Don't know, go to 108***	
106	How long does it take you to walk to a place where community outreach clinics are conducted	**Interviewer: please enter the time in minutes**		
107	How frequent are these community outreach clinics	1. Once every two weeks 2. Once a month 3. Once in two months 4. Once in three months 5. Once in four months 6. Once in five months 7. Once in six months 8. Other (specify)		
108	How many health facilities are around this community/area?	***Interviewer: Please enter the number of health facilities in the column on the right***		
109	How long would it take to walk to the nearest health facility that you often go to?	***Interviewer: Please enter the response in minutes in the column on the right***		
110	Do you generally find it easy to pay for the full cost of health care for your ill child?	1 Find it easy 2 Find it a little difficult 3 Find it very difficult 4 I cant even afford to go	***Interviewer, clarify full cost means all costs associated with hospital visit eg drugs, consultation fee, transport, food along the way etc***	
111	What factors discourage you from seeking treatment for an ill child from the health facility?	1. Financial costs 2. Lack of drugs at the facility 3. Distance, it is very far 4. Do not want to lose time from work 5. Competing needs within the household 6. Lack of decision making capacity with regard to seeking treatment for the child 7. Health workers are not friendly 8. Others (specify)	***Multiple responses acceptable***	
112	When health care instructions for child health care are communicated to you by a health worker, do you find them easy to understand and follow?	1. Always find them easy 2. Mostly find them easy easy 3. Sometimes find them easy 4. Never find them easy 5. No occasion to assess	**If 1 or 2, skip 113**	

113	What are the difficulties involved in either understanding or following instructions?	1. Language (health literacy problem) 2. Confusing 3. Too much information 4. Instructions communicated too fast 5. Too many other concerns so preoccupied 6. Others (specify)	***Multiple responses acceptable***	
114	How would you describe the quality of child health services at the health facility where you mostly seek services?	1. Very good 2. Good 3. Fair 4. Bad 5. Very bad		
115	In your opinion what constitutes quality child health services ?	1. Availability of drugs and other medical supplies 2. Good attitude of health workers 3. Convenient opening times 4. More home and community visit 5. General cleanliness 6. Proper and easy-to-follow instructions 7. Minimal waiting time 8. Others (specify)	***Multiple responses acceptable***	

CONCLUSION

Thank you very much for your participation in this survey. Are there any questions? Goodbye

APPENDIX VI: FOCUS GROUP DISCUSSIONS GUIDE FOR CARE GIVERS ON HEALTH SEEKING BEHAVIOUR, HEALTH SERVICES AND CHILD CARE PRACTICES

INTRODUCTION AND INFORMED CONSENT

Hello. My name is _____ and my colleague is _____. We appreciate your coming upon invitation. We are conducting a research study as part of doctoral studies. We have chosen three areas in Lilongwe and this area is one of those chosen. The main aim of the research is to find out child health and survival in urban slums. While this study is mainly for academic purposes we will also share what we have learned from community members with policy-makers and encourage them to make appropriate decisions that will help the people of these communities especially pertaining to under-five child health.

We're interested in learning about what is going on in **[Name of Community]**, especially with regard to the health of under-five children. Many times, people from outside think they know what families are experiencing in this community when they really don't. To us, you are the real experts, and there's a lot we can learn from you. So today we would like to ask you a few questions about what people in this community experience and how they handle different situations in pursuing the health of their children.

Your participation in this group discussion is voluntary. You may choose to decline to answer questions that you are not comfortable with. There is no direct benefit for your participation in this study. However as mentioned earlier the findings will be essential to improve child health. We encourage you to participate freely as this is an informal discussion. We wish to assure you that whatever we talk about today is confidential. We intend to record our discussions for purposes of this research. No one outside the research team will have access to this recording. Any of you who wishing to have access to this recording to verify or otherwise is free to do so. Whenever we write a report, we will conceal your identity even when we quote your exact words. If there are any questions you are uncomfortable to answer, kindly let us know

- ✓ **Explain the note taking and tape-recording roles**
- ✓ **Give a few minutes for answering any questions regarding the interview**
- ✓ **Provide ground rules for the discussion**

Finally, we acknowledge how difficult it can be to discuss some of these issues openly. However, your frank responses and discussion will be most helpful to us as we try to really understand these issues. Remember, your answers to our questions will not be considered "right" or "wrong." They are merely information you will provide based on your experiences, observations, or feelings. Are we all comfortable to proceed? If you agree, we will ask each of you to sign a form giving consent for your participation in this study.

Before we begin, let us introduce ourselves. You could just tell everyone your name and how long you've lived in this community.

CHILD CARE PRACTICES

1 We are interested to find out the child care practices for children under the age of five

- What are the feeding practices for children in this area from birth to the age of five years? PROBES: - Breast feeding initiation? Colostrum feeding? Exclusive breast feeding? When does complementary feeding start? Frequency of feeding for children? Any traditional concoctions for children?
- What are the child stimulation activities that you perform for children in this community?
- How and where do you dispose of children's excreta?
- What are this community's perceptions and practices pertaining to childhood immunizations; including Vitamin A supplementation?
- How do you manage a child with fever at home?
- How do you manage a child with diarrhoea at home?

CHILDHOOD MORBIDITY

1. What are the most critical illnesses that children suffer from in this community?
   MODERATOR: *List all diseases and problems mentioned*
2. Of the illnesses that you have mentioned, which is the single most important disease or problem that leads to child deaths?
3. Why is this such a big problem in the community?
4. What do you regard as danger signs for child health for which you definitely seek treatment?

HEALTH SERVICES AND HEALTH SEEKING BEHAVIOR

1. What do people do when children under 5 years get sick?
   - Where do you go to seek health care for children under five years of age?

2. Can you tell us the major providers of health services in this community? Please indicate any individual, groups, type of facility that you consider as a health service provider entity, whether traditional healer, government or private facility etc?

3. In your opinion, of the ones you have mentioned within your community, who / which facility provides the best care for Under five children? Why?

4. What constitutes good health services for children in this community? Please mention all the attributes you consider to be important for you to classify health services as good
MODERATOR: Probe until saturation on this subject

6. If people choose not to take their sick children to a health facility, what do they do instead?

7 What problems do you face in accessing and utilizing health services within your area? What are your concerns about under-five child health services in general?

8. We are also interested to know if you have community outreach activities in this community, particularly providing child health services
MODERATOR: For this question and the next please probe on provision of specific components of Community IMCI as on the reference material given

9. Are there community health workers that come to work in this community?

- What do they do?
- Where are they based?
- How often do they come here
- Do you pay for their services? How are their services priced?

10. Have there been any programs or initiatives to solve any of the child health related problems in the community?

- What was done?
- Which organization/group did this initiative?
- What do people think about the organization that was involved in this initiative?

11. What should be done to improve the health and survival of U-5 children in this community?

OTHER SOCIAL ISSUES

1. We are interested to know who are the key decision makers in households of this community?. Explain particularly with regard to decision making on seeking health services for an U-5 child?
2. In terms of health or other issues, we are interested to know if there are differential treatments between a girl or boy of U-5 years of age? Why?
3. What are the health and social problems that you face in your community especially those that affect under-five child

APPENDIX VII: INTERVIEW GUIDE FOR KEY INFORMANTS INTERVIEWS IN CHILD HEALTH SERVICE PROVISION AND HEALTH POLICY

INTRODUCTION AND INFORMED CONSENT

Give the potential participant the Participant Information Leaflet or explain its contents. To sign informed consent form if agree to participate

CHILD HEALTH SERVICES IN URBAN SLUMS

1. How are child health services organized in the urban setting and particularly in the slum communities?

2. One of the major strategies for child health service delivery nationally is the Community Integrated Management of Childhood Illnesses (C-IMCI). I would like to know how this strategy is being delivered within the urban slum communities

   - **Probes:** *who are involved; is the community involved in planning, implementation including service delivery. How about issues of coverage of C-IMCI within the urban slum areas? Is the monitoring data disaggregated to capture the slum areas?*

   - In particular what specific strategies are in place to promote uptake of child health services for care takers of mothers in urban slum communities? (is education on danger signs for child health part of the intervention package?
   - Is the strategy termed integrated Community Case Management (iCCM) implemented within the urban slum areas? What is the scope of implementation?

   - Could you explain to me, considering the context of the urban settings, whether you still use Health Surveillance Assistants and/or Community Health Workers in the urban slum settings? If so, how are these cadres operating and how are they being supervised

3. Would you explain to me how the child health and survival structures operate at national, district and community levels?
   Probes: what technical working groups are available? Is the child health and survival working committee operational? How about integration of maternal and child health services? Integration of child health programmes?

4. In your opinion, do you think there should be special attention in promoting child health and survival among the disadvantaged areas of the urban setting such as the urban slums? Explain?
   Probes: *issues of social determinants of health such as sanitation, safe water, poverty,*

5. What in particular should be done as an improvement to what is probably already happening or as a new strategy altogether to promote the health and survival of children in urban slums?

6. Other than what you have already mentioned have there been any projects or programs to improve child health services targeting the urban slum communities?
   - Which organizations?
   - What was the strategy?
   - What have been the results

7. What have been your experiences in dealing with urban slum populations in relation to health services in general and child health services in particular?

8. What attributes of a health system do you think are important to care givers of children in slum areas, that influence their decisions to seek care from a health facility?

9. How would you describe the health policy environment for disadvantaged children, such as those residing in urban slums at present?
   – **Probes**: *does the policy environment give any explicit indication to address needs of slum dwellers? Is it likely to?*

CONCLUSION:
I appreciate your input into this study. Thank you very much for your willingness to participate. Goodby

APPENDIX VIII: CODING FRAME FOR KII (FOR FGD WAS FROM 2C)

1. **Child health strategy that is context specific to urban slums:**
    A. Delivery of high impact interventions in a standardised way whether in urban slums, rural or urban.
    B. Child health services organised as per continuum of care
    C. Health and social policy content predominantly rural based
    D. Mapping interventions based on health need – epidemiological evidence
2. **Governance structures / institutional arrangements for child health service delivery**
    A. Policy Level:
        i. Child Survival Technical Working Group
        ii. Child health disease control programmes
    B. Implementation level : District
        i. District Health Management Team
        ii. Child health initiatives project coordination
        iii. Knowledge of IMCI
        iv. No knowledge of IMCI or Community IMCI
    C. Implementation level: Community:
        i. Health Surveillance Assistants
        ii. Community Based Child Care Centres for delivery of Early child development interventions e.g child stimulation
        iii. Village Health Committees
        iv. Community health volunteers
        v. Existence of Non-Governmental Organisations
        vi. Community Case Management not in place
3. **Barriers to care seeking for child health services**
    A. Supply side (health system) factors
        i. Unavailability and lack of medicines and other supplies
        ii. Lack of human resources
        iii. Long waiting times
        iv. Negative attitudes of health workers towards clients/patients (clients/patients not treated with respect)
        v. Distance to health facility (long distance)
        vi. Lack of health infrastructure
        vii. Lack of privacy and confidentiality
    B. Demand side (community / household) factors
        i. High illiteracy levels
        ii. Belief in initial contact with traditional medicine
        iii. Inadequate financial resources
        iv. Influences of religious beliefs
4. **Facilitative factors of seeking hospital care for child**
    A. Supply side (health system) factors

i. Availability and lack of medicines and other supplies
ii. Adequate numbers of human resources
iii. Reduced waiting times at hospital
iv. Good attitude of health workers (welcoming and friendly)
v. Proximity to health services

B. Demand side (community / household) factor
i. Adequate financial resources to afford costs associated with health care seeking
ii. Previous positive experience with health system.

5. **Provision of child health services:**
A. Provision of general health talks in child health clinics
B. Provision of community outreach clinics to promote uptake of child health services
C. Health education on danger signs for child health
D. High attrition of population in slums as a challenge to community health service delivery
E. Services that are provided (what services e.g. nutrition, HIV and AIDS support, referral)

6. **Seeking care for child health services:**
A. Preferred health provider (private, public, traditional healer)
B. Home management for childhood illness before hospital use?
C. Late care seeking from hospital
D. Timely care seeking from hospital

7. **Addressing social determinants of child health:**
A. Health risk due to overcrowding
B. Need for a housing programme
C. Increase access to clean and safe water
D. Inter-sectoral coordination to tackle social determinants of child health
E. Service delivery in child safety, food security, human rights and general child protection, education, school
F. Overarching slum upgrading programmes
G. Sanitation
H. Improving economic situation of care givers / communities

8. **Health outcome (measures or indicators)**
A. Common illnesses
B. Reduction of childhood morbidity and mortality
C. Increasing childhood morbidity and mortality

9. **Health Information**
A. Data collection systems
i. Facility and community data collection systems in place
ii. Data disaggregated
iii. No data disaggregation
B. Research evidence

10. **Cross-cutting / Miscellaneous**

APPENDIX IX: DCE QUESTIONNAIRE

DCEQ CODE_____

Data collection tool for a DCE: relative significance of health system factors in influencing care seeking decisions for under-five child health services

Slum Name : .....
Date of Interview : .....
Enumerator : .....
Traditional Authority : .....

Introduction (*Read this and additional content on the Participant Information Leaflet*)
We would appreciate if you could answer some questions from this questionnaire. The questions pertain to significant factors for your choice of health care for your children under the age of five years. This survey is part of a PhD study that is being carried out in three areas of Lilongwe city. This research study is for academic purposes leading to a PhD. There are no direct benefits for your participation in this research. However, the information you provide is important to inform stakeholders dealing in child health to improve delivery of child health services and promote the health of children especially in urban slum settings.

Participation is entirely voluntary. We wish to assure you of the confidentiality of the responses that you provide. The choices you make on this questionnaire will not affect you in any way. Thank you for your participation

Section A: Choice sets
There are 11 choice sets in the subsequent sections. The choice sets relate to different types of a health facility from which you may seek care. Each choice set has two alternatives. Please, state/tick your preferred option for each set of choices.

Each alternative in the choices is constitutes of factors that describe the nature of a health facility. There are six factors in total (*Explain the six attributes and their levels using pictograms)*:
Distance to health facility – This entails how long it takes for you to reach the health facility. The distance is expressed in minutes (hrs) it would take to walk and it has three levels namely walking for 30, 60 and 90 minutes
Cost to you – describes the cost of accessing health services for your under-five child. There are three levels of this attribute namely; no cost to you, a cost of K600 and K1700.00.
Availability of medicines and supplies – relates to whether the medicines and supplies required to provide health care to your child are present at the facility or not.
Waiting time – this describes the time it would take for you from the point that you start waiting to be assisted to the time you have navigated through the health facility and received all the

available help and ready to go back home. The waiting time also has three levels namely, waiting for 2 hrs, 3.5 hrs and 5 hrs.

Attitude of health workers: describes how health workers relate with you. Whether they are friendly and treat you with respect or they are unfriendly and seem not to care too much about you and your sick child.

Nature of examination: this entails how health workers examine your sick child. They may not examine the child or may examine superficially or do a thorough examination.

An example is provided below showing the choice made (*show the pictogram example).*

Example

	Health facility 1	**Health facility 2**
Distance to health facility	One hour	One and half hours
Availability of medicine	Medicine and equipment available	Medicine and equipment not available
Waiting time	2 hours	5 hours
Attitude of HW	Treat without respect	Treat with respect
Nature of examination	Superficial examination	Through examination
Cost to you	K1700	Free

Which of the two alternatives would you choose	Health facility 1	Health facility 2
	√	

As you can see, in the above example the individual chose 'Health facility 1' over 'Health facility 2' after comparing the two alternatives. So we can notice that this individual is willing to pay K1700 for a health facility that is within one hour walking distance, has medicines and equipment available and will wait for two hours and will have a superficial examination and will not be treated with respect than getting a free service from a facility which is one and half hours away with thorough examination from respectfully treating staff where there is no medicine and equipment and has waiting time of 5 hours.

Similarly, in the following questions, we will present to you a set of alternatives from which we want you to make a choice. Each alternative is representing a set of attributes which jointly define the health facility from which you may seek care. So we want you to consider these alternatives and tell us which one you would decide to go to with your sick child.

Choice set 1

	Health facility 1	**Health facility 2**
Distance to health facility	One hour	One and half hours
Availability of medicine	Medicine and equipment available	Medicine and equipment not available
Waiting time	3 and half hours	5 hours
Attitude of HW	Treat without respect	Treat with respect
Nature of examination	Thorough examination	Thorough examination
Cost to you	Free	K 1700

Which of the two alternatives would you choose	Health facility 1	Health facility 2

Choice set 2

	Health facility 1	**Health facility 2**
Distance to health facility	One hour	One and half hours
Availability of medicine	Medicine and equipment not available	Medicine and equipment available
Waiting time	2 hours	5 hours
Attitude of HW	Treat with respect	Treat without respect
Nature of examination	Superficial examination	Not examined
Cost to you	K 1700	Free

Which of the two alternatives would you choose	Health facility 1	Health facility 2
	☐	☐

Choice set 3

	Health facility 1	**Health facility 2**
Distance to health facility	Half an hour	One and half hours
Availability of medicine	Medicine and equipment not available	Medicine and equipment not available
Waiting time	5 hours	2 hours
Attitude of HW	Treat without respect	Treat with respect
Nature of examination	Superficial examination	Through examination
Cost to you	K 600	Free

Which of the two alternatives would you choose	Health facility 1	Health facility 2
	☐	☐

Choice set 4

	Health facility 1	**Health facility 2**
Distance to health facility	One and half hours	Half an hour
Availability of medicine	Medicine and equipment available	Medicine and equipment not available
Waiting time	2 hours	3 and half hours
Attitude of HW	Treat without respect	Treat with respect
Nature of examination	Not examined	Not examined
Cost to you	K 600	Free

Which of the two alternatives would you choose	Health facility 1	Health facility 2
	☐	☐

Choice set 5 *(Hold Out)*

	Health facility 1	**Health facility 2**
Distance to health facility	One and half hours	30 minutes (half hour)
Availability of medicine	Medicine and equipment available	Medicine and equipment not available
Waiting time	3 and half hours	2 hours
Attitude of HW	Treat without respect	Treat with respect
Nature of examination	Not examined	Thorough examination
Cost to you	Free	K 1700

Which of the two alternatives would you choose	Health facility 1	Health facility 2

Choice set 6

	Health facility 1	**Health facility 2**
Distance to health facility	One and half hours	Half an hour
Availability of medicine	Medicine and equipment available	Medicine and equipment not available
Waiting time	3 and half hours	2 hours
Attitude of HW	Treat with respect	Treat without respect
Nature of examination	Superficial examination	Not examined
Cost to you	K 600	K 1700

Which of the two alternatives would you choose	Health facility 1	Health facility 2

Choice set 7 *(Hold out)*

	Health facility 1	**Health facility 2**
Distance to health facility	One and half hours	One hour
Availability of medicine	Medicine and equipment available	Medicine and equipment not available
Waiting time	3 and half hours	5 hours
Attitude of HW	Treat with respect	Treat with respect
Nature of examination	Superficial examination	Thorough examination
Cost to you	Free	K 1700

Which of the two alternatives would you choose	Health facility 1	Health facility 2

Choice set 8

	Health facility 1	**Health facility 2**
Distance to health facility	One hour	Half hours
Availability of medicine	Medicine and equipment not available	Medicine and equipment available
Waiting time	3 and half hours	2 hours
Attitude of HW	Treat with respect	Treat with respect
Nature of examination	Not examined	Superficial examination
Cost to you	Free	K 600

Which of the two alternatives would you choose	Health facility 1	Health facility 2

Choice set 9

	Health facility 1	**Health facility 2**
Distance to health facility	One hour	Half an hour
Availability of medicine	Medicine and equipment not available	Medicine and equipment available
Waiting time	5 hours	3 and half hours
Attitude of HW	Treat without respect	Treat without respect
Nature of examination	Superficial examination	Through examination
Cost to you	Free	K 1700

Which of the two alternatives would you choose	Health facility 1	Health facility 2

Choice set 10

	Health facility 1	**Health facility 2**
Distance to health facility	Half an hour	One and half hours
Availability of medicine	Medicine and equipment available	Medicine and equipment not available
Waiting time	5 hours	3 and half hours
Attitude of HW	Treat with respect	Treat without respect
Nature of examination	Through examination	Superficial examination
Cost to you	K 600	K 1700

Which of the two alternatives would you choose	Health facility 1	Health facility 2

Choice set 11

	Health facility 1	**Health facility 2**
Distance to health facility	One hour	One hour
Availability of medicine	Medicine and equipment not available	Medicine and equipment available
Waiting time	2 hours	5 hours
Attitude of HW	Treat without respect	Treat with respect
Nature of examination	Through examination	Not examined
Cost to you	K 600	K 1700

Which of the two alternatives would you choose	Health facility 1	Health facility 2

12 How easy or difficult did you find the section on choice sets

1. Very Easy
2. Easy
3. Difficult
4. Very Difficult
5. Extremely Difficult

Section III Socio-demographic characteristics

Please answer the following questions about yourself. Although some of these questions are personal, the information you give is confidential.

1. How old is the respondent _____
2. Gender of respondent? Male ☐ Female ☐
3. Marital status Never married ☐ Married ☐ Divorced/separated ☐

Widow widowed ☐

4. How many children?
   1. One child ☐
   2. Two children ☐
   3. Three children ☐
   4. Four children ☐
   5. Five or more children ☐

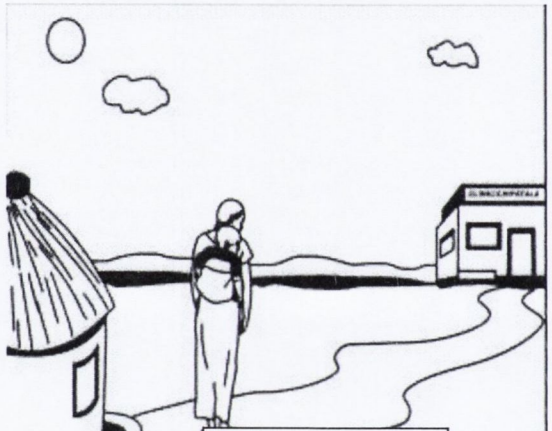
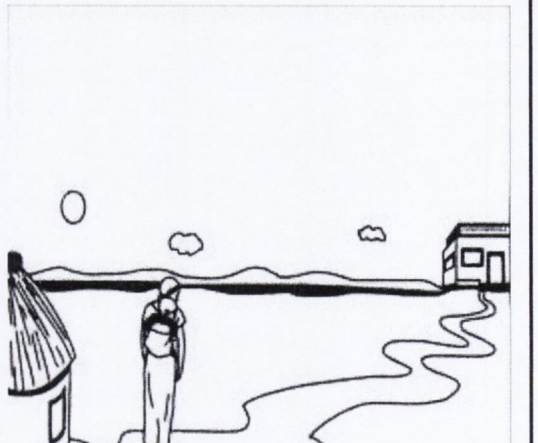
5. What is the level of respondent's education?
   1. No education ☐
   2. Primary education ☐
   3. Secondary education ☐
   4. Tertiary education ☐

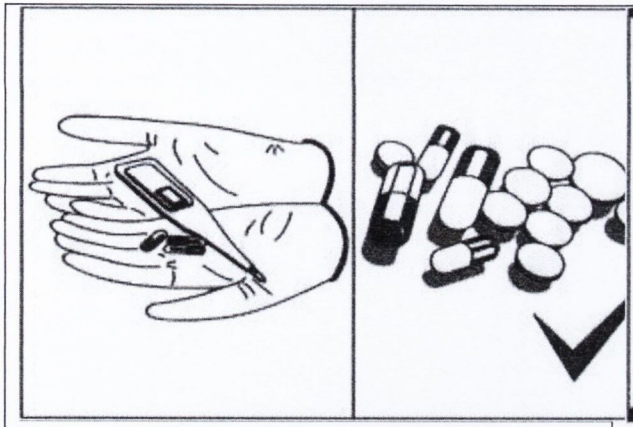
6. What is the estimated monthly household income? _____

7. What is your occupation?
   1. Government employee at professional level ☐
   2. Government employee at junior level ☐
   3. Self employed doing small scale business ☐
   4. Casual work / labour ☐
   5. Student ☐
   6. Private sector at professional level ☐
   7. Private sector at junior level ☐
   8. Farming ☐
   9. No activity ☐

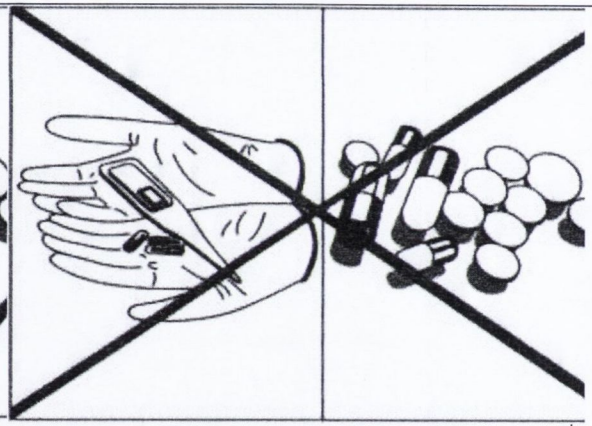
8. Sex of the child
   1. Male
   2. Female

APPENDIX X: PICTOGRAMS FOR EACH OF THE DCE ATTRIBUTES AND LEVELS

		
This entails that it will take you 30 minutes to walk from your home to the health facility to access health care for your sick child	This entails that it will take you 60 minutes (one hour) to walk from your home to the health facility to access health care for your sick child	This entails that it will take you 90 minutes (one and half hours) to walk from your home to the health facility to access health care for your sick child
You are not going to pay anything. Health care services for your child are free at the point of use	 This means that you will pay a total of K700 as cost of health care for your sick child.	 This means that you will pay a total of K1700 as cost of health care for your sick child.



This means that medicines and medical supplies required to treat your child are all available at this health facility.



This means that medicines and medical supplies required to treat your child are not available at this health facility.



120 Minutes (2hrs)

This picture shows women waiting at a health facility. In this case you will wait for 120 minutes (2 hours) before receiving all child health care and before you can go home.



210 Minutes (3 & half hrs)

This picture shows women waiting at a health facility. In this case you will wait for 180 minutes (3 hours) before receiving all child health care and before you can go home.

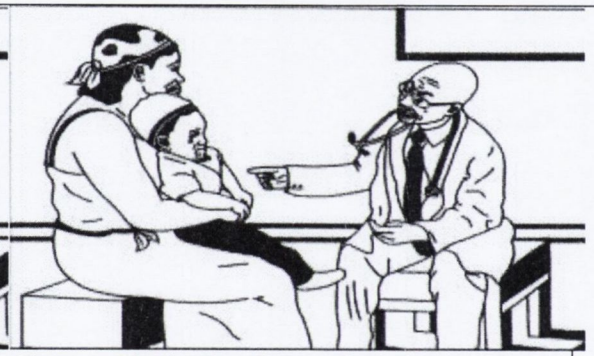


300 Minutes (5hrs)

This picture shows women waiting at a health facility. In this case you will wait for 300 minutes (5 hours) before receiving all child health care and before you can go home.



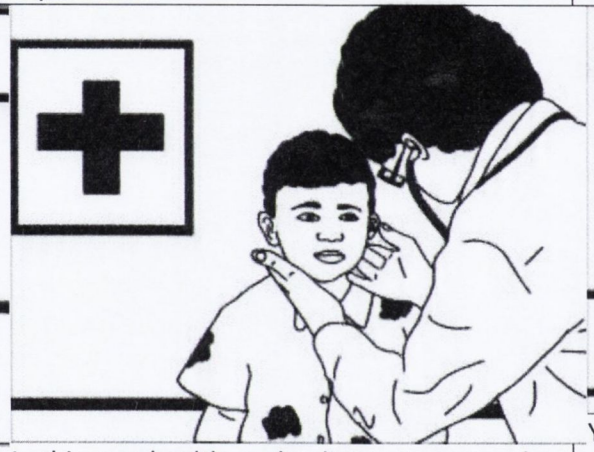
This entails that at a health facility, health workers are friendly and treat you with respect. They listen carefully when a client is explaining and put on a happy face



This entails that health workers do not treat with respect, are unfriendly and seemingly in a hurry and angry when listening to your explanation.



In this case, the health worker listens to your explanation and examines your sick child thoroughly.



In this case health worker listens to you and superficially examines your child



Your child is not examined, health worker just writes as you explain and prescribes medication immediately you finish so they only rely on subjective health information