Perceptions, Management and Barriers to Care-seeking for Childhood Diarrhea, Malaria, and Pneumonia:

UGANDA · KENYA · NIGERIA · ETHIOPIA · NIGER

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ACRONYMS

ACTs	Artemisinin-based combination therapies (Antimalarial)
AQ	Amodiaquine (Antimalarial)
ARI	Acute Respiratory Infection
CBO	Community-based Organization
CORPs	Community Owned Resource Persons
CMDs	Community Medicine Distributors
DDs	Drug Distributors
DHS	Demographic and Health Survey
FGDs	Focus Group Discussions
HMM	Home Management of Malaria
IMCI	Integrated Management of Childhood Illness
ITNs	Insecticide Treated Nets
MOH	Ministry of Health
NGO	Non-Government Organization
ORS	Oral Rehydration Salts
ORT	Oral Rehydration Therapy
RDTs	Rapid Diagnostic Tests (for malaria)
SES	Socioeconomic Status
SP	Sulfadoxine-pyrimethamine Antimalarial
UNICEF	United Nations Children's Fund

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EXECUTIVE SUMMARY

This report describes the findings of a literature review examining the perceptions and practices of caregivers responding to childhood pneumonia, diarrhea or malaria. The Health Section of UNICEF's Programme Division has been undertaking a new initiative to examine barriers to care-seeking for these conditions, as they remain the three largest killers of children; these three illnesses alone account for nearly half of all child deaths. Globally, these common childhood illnesses place a huge burden on families, particularly the poorest and most vulnerable. Simple, inexpensive treatments are available for these diseases, yet too few children receive appropriate care. As a result, several countries still suffer a high burden of childhood morbidity and mortality due to these conditions.

Barriers preventing appropriate care for these childhood illnesses may be related to problems with supply of commodities, quality of services provided, or poor demand for or utilization of effective treatments. Or, constraints affecting care-seeking may be due to a caregiver's lack of knowledge, finances, social/ cultural/ religious norms, beliefs about the etiology of disease, or limited autonomy for decision-making in the household. In addition, in many countries there are insufficient social protection mechanisms, such as social health insurance, cash transfer programs, and other incentives to motivate care-seeking by reducing financial barriers to care.

A literature search was conducted using the electronic databases PubMed, PsycINFO, Global Health (EBSCO), CINAHL Plus, SocINDEX, and Africa-Wide Information. Quantitative and qualitative studies of childhood illness perceptions and care-seeking behaviors in Ethiopia, Kenya, Niger, Nigeria and Uganda from 2001-2011 were reviewed. Additionally, grey literature was gathered on each of these five countries to further inform the review.

There were many similarities across the five country settings concerning care-seeking practices. A common response to childhood illness was to provide initial care in the home or to obtain treatment from a nearby source. The preferred source of care for a sick child varied across location and from urban to rural setting. However, the most common sources of care often included clinics or drug shops.

Recommendations to improve demand for care focused greatly on educational interventions to improve treatment seeking and practices in the home. Caregiver education must improve recognition of severe illness and motivate prompt care-seeking. Educational interventions must also dispel common myths and dangerous practices. The potentially serious nature of childhood illness must be conveyed to the caregiver, as delays in seeking care were common. Those in the child's extended family network and in the community must also be reached with messages, as caregivers often seek opinions of others.

When caregivers seek care in their community, there are some settings where community health workers are a common source of care. Their use could be improved and their reach broadened. Effective drugs need to be brought within better reach of the community, through drug vendors or community health workers. Interventions could also target drug shops in an effort to improve demand for appropriate care as caregivers frequently sought treatment from the retail sector.

BACKGROUND

Globally, more than 8 million young children die every year [1]. Three diseases, namely diarrhea, malaria, and pneumonia, cause the bulk of child mortality and account for more than half of all childhood deaths outside of the neonatal period. The burden of these illnesses is extraordinary [2]:

- diarrhea - 2.5 billion cases and 1.336 million child deaths annually
- malaria - almost 250 million cases and 732,000 child deaths every year
- pneumonia – 156 million episodes and 1.575 million deaths annually in under-fives

The poorest populations suffer the greatest burden of these common childhood illnesses: the poor are at greater likeliness of exposure to disease, are less resistant to disease, and are more likely to have inadequate healthcare seeking behavior [3]. In a poor family, a child has increased risk of exposure to disease due to a higher likeliness to lack an improved water source, to lack adequate sanitation, and to be exposed to indoor air pollution [4]. When children are ill, the likeliness that they will be properly administered anti-malarial treatment increases with socioeconomic status, as does the likeliness that they will receive appropriate antibiotics for pneumonia [4, 5].

When seeking care, the poor tend to travel further to a health facility and for longer time, due to difficulty in transportation [4, 6, 7]. The poor have lower probability of receiving prompt and effective treatment when arriving to a health care center, as the facilities serving the poor are less likely to be properly staffed and are less likely to be stocked with essential drugs [3, 4, 8-10]. These inequalities are evident in the analyses of Demographic and Health Survey (DHS) data from dozens of countries: poor children have less likeliness of survival than peers who are more financially well-to-do [3], and they are dying at an alarming rate.

More than five million of the eight million under-five child deaths every year could be averted with simple proven interventions [11]. The following treatments for diarrhea, malaria and pneumonia can be administered in the home, by a caregiver or layperson, for relatively little cost to health systems:

- Oral rehydration solutions can prevent the majority of diarrheal deaths and cost less than $0.50 on average
- Artemisinin-based combination therapies (ACTs) can prevent the majority of malaria deaths and cost less than $0.80 on average
- Antibiotics such as amoxicillin can prevent the majority of pneumonia deaths and cost about $US 0.30 per treatment dose.

In many countries, efforts are being made to expand access by making these treatments available within communities. Still, too few children receive appropriate care. And, the results are fatal for millions of young children every year.

Approaches to reducing child mortality in this context are represented in the conceptual framework below. This report will focus on identifying barriers to care-seeking for childhood illness that impede access to or demand for appropriate health services for the sick child. Factors related to the first two aspects (improved access and increased demand) that may be preventing children from receiving appropriate care will also be explored.

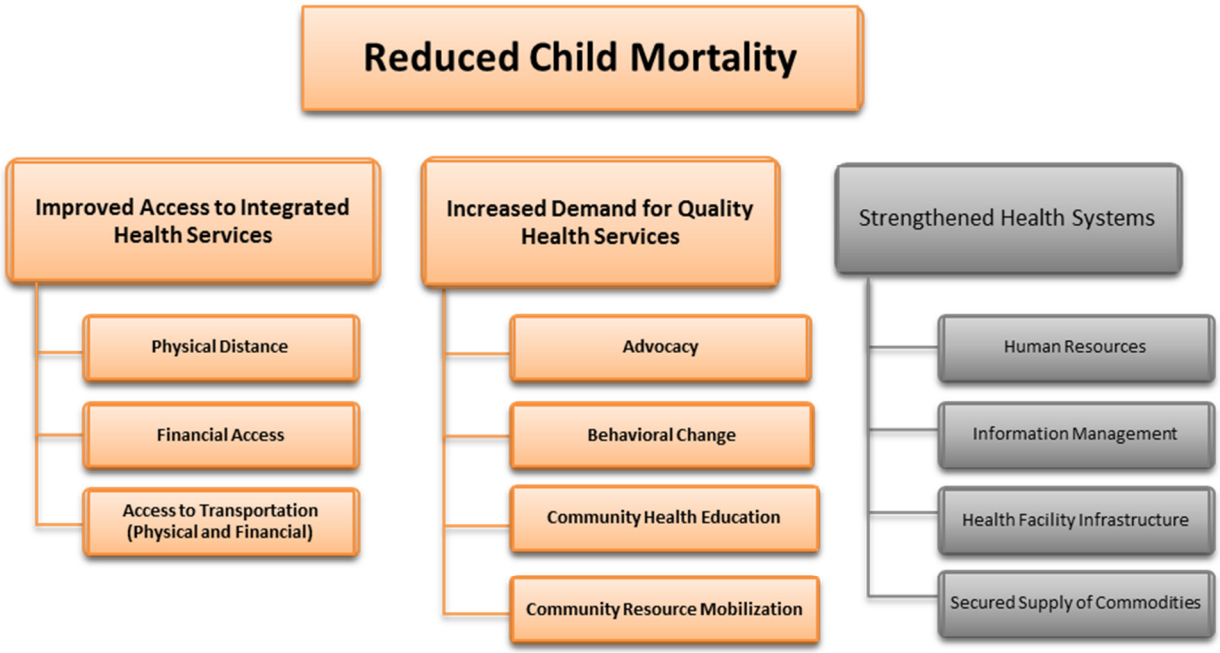

Figure 1. Conceptual Framework of Approaches to Reduce Child Mortality

CONTEXT

The Health Section of UNICEF's Programme Division is undertaking a new initiative to examine barriers to care-seeking and treatment for diarrhea, malaria and pneumonia. As these conditions remain the three largest killers of children, together they pose significant problems in communities, contribute to high rates of under-five mortality, and place a huge burden on families, particularly the poorest and most vulnerable.

Barriers to appropriate care for these childhood illnesses may be related to problems with supply of commodities, quality of services provided, or poor demand for or utilization of effective treatments. Or, constraints affecting care-seeking may be due to a caregiver's lack of knowledge, finances, social/ cultural/ religious norms, beliefs about the etiology of disease, or limited autonomy for decision-making in the household. In addition, in many countries there are insufficient social protection mechanisms, such as social health insurance, cash transfer programs, and other incentives to motivate care-seeking by reducing financial barriers to care. As a result, several countries around the globe still suffer a high burden of childhood morbidity and mortality due to these common childhood illnesses. The focus of this report is on five specific countries within Sub-Saharan Africa where the burden of these illnesses remains high: Ethiopia, Kenya, Niger, Nigeria, and Uganda. Across these five countries, the percentage of under-five deaths attributable to each of these conditions varies (see Figure 2 below). This may be due to lower prevalence of an illness, (e.g., countries with endemic malaria) or due to differences in access to or provision of treatments in these different locations.

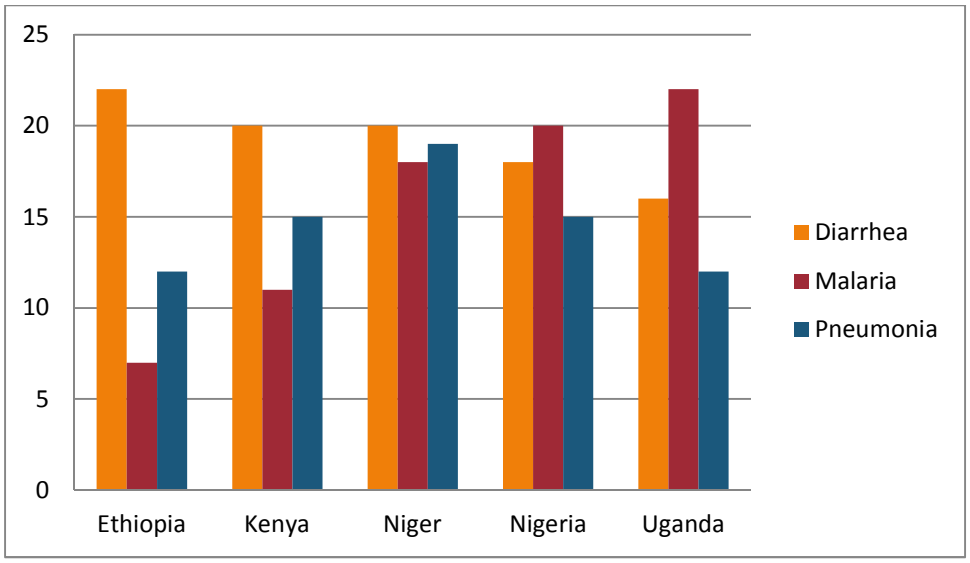

Figure 2. Bar Graph Representing Percent of Under-five Deaths Attributable to Diarrhea, Malaria and Pneumonia in 2008.[2]

This desk review synthesizes available qualitative, quantitative, and grey literature on perceptions and management of childhood diarrhea, malaria, and pneumonia in these countries. It describes barriers that affect care-seeking or provision of treatment for these conditions by caregivers of children under 5 years and other household decision-makers in order to:

- develop a better understanding of the barriers to effective treatment/care-seeking for childhood illness
- draw out programmatic and policy implications, and recommendations for strengthening demand for effective treatments
- suggest recommendations for additional in-depth research in these five countries

INTEGRATING EVIDENCE INTO PRACTICE

There are distinct challenges that prevent smooth integration of the evidence base into child health efforts. One gap exists in bringing "evidence into policy" and another in bringing "policy into practice". The hope in presenting this summary desk review of current literature is that these gaps may be narrowed: that evidence may be discussed in the policy forum, and that lessons learned from researchers may guide how to best implement policy to ensure success in practice.

Ideally, such an exchange would work in a reciprocal manner between science and policy forums: science would speak to the development of better policy and practice; And the needs of policymakers and program development officers would help formulate research questions for scientists to answer.

While there was accumulated body of research selected for inclusion in this review, there remained a number of limitations preventing smooth adoption of these findings into smooth integrated

recommendations for policy or practice. As such, there are a number of items for consideration when reviewing the findings presented below.

Firstly, the scientific community is not uniformly aligned in the manner in which data of similar types is measured or presented, making generalizations across studies and meta-analysis difficult. As well, terminology across studies is not necessarily ubiquitous. For example, interpretations for the term "Care-seeking outside the home" vary greatly from study to study. These and other similar considerations require the reader to adopt a general understanding of the recommendations presented below and apply them to each local setting. The strength of this desk review is the variety and heterogeneity of findings uncovered, rather than few overarching findings that could be universally applied.

While looking to the strengths of researchers to adhere to scientifically rigorous methodologies and formal analyses, the public health practitioners and policy makers are relied upon to interpret and apply these recommendations through a lens that can only be colored by knowledge of the true challenges faced in the policy forum, during program planning, and in practice.

METHODS

The Search Process

Refined automated searches were conducted using the electronic databases PubMed, PsycINFO, Global Health (EBSCO), CINAHL Plus, SocINDEX, and Africa-Wide Information. Studies that solely examined effectiveness of oral rehydration salts (ORS) or zinc, antibiotics, antimalarials, traditional treatments, and over-the-counter treatments were not targeted for inclusion in the review. However, studies that focused on efficacy or interventions that also reported on perceptions of illness, or care-seeking behaviors were included. Searches differed for each database, depending on size and characteristics of literature indexed, but typically limited articles by:

- country location (Ethiopia, Kenya, Niger, Nigeria, Uganda)
- disease entity (fever, diarrhea, malaria, pneumonia, acute respiratory infection)
- population studied/participants (child, infant, caregiver, mother, father, household, community)

Additional descriptors and medical subject headings were used to ensure capture of articles specific to topics like: attitudes, beliefs, perception, knowledge, behavior, care seeking, decision-making, and barriers. Through initial scans of all titles, reading of abstracts, and the blanket import of all results when using the most refined searches, a total of 257 unique articles were selected for closer review. Multi-country studies (that included other countries in addition to one or more of the five countries of interest) were included only if data were presented individually for each country.

Qualitative and quantitative research was included, with national surveys, cross-sectional studies, intervention studies, reports on knowledge/attitudes/practices or beliefs and ethnographic investigations among the literature selected. The studies involved caregivers of children under 5 years and other household decision-makers, and key informants like community health workers, traditional healers and drug sellers.

The temporal limits were chosen to ensure a comprehensive review that would best reflect only the current barriers or determinants in each country that may affect care-seeking and demand for care. Studies taking place in Ethiopia, Kenya, Niger and Uganda from 2001 to present were selected for inclusion. While, due to the large number of available documents and reports from Nigeria, only those published from 2006 to present were considered. Studies taking place in Uganda, Kenya, Nigeria and Ethiopia were limited to only those full-text documents available in English. Available studies from Niger, which were far more limited in number, were targeted in French and in English.

Primary Data Extraction

Data from each included study was coded in Excel using a data extraction form designed *a priori*, containing the categories presented below (Table 1). Studies and reports were not rated based on quality, nor excluded because of quality concerns. Apparent limitations of the studies or quality concerns illustrated by authors were noted during data extraction. Additionally, reasons for exclusion (*e.g.* data not presented separately for adults and children, or article reported only preventive interventions) were documented during this phase for all publications removed from further consideration.

Title of Article or Report	Study Setting (Rural / Urban)
Study Design	Study Population
Authors	Programmatic Implications
Methods	Illness or Illnesses Described
Citation/ Source	Number of participants
Findings	Limitations
Location of Study (District)	Objectives or Focus of Study or Report

Table 1. Categories of data extracted from published reports

Synthesis of Findings

The synthesis process was designed to best capture the individual results and findings specific to each of the studies, with the goal of allowing the evidence to be presented in a most useful manner to guide the program development and policy deliberation forums. As such, data was synthesized by country and by disease area. As the objectives, populations, and disease areas differed for each study, this process was first informed by initial reads through a number of the articles.

A table was created to house the data and taxonomy generated. Development of categories was shaped dually by the topics and findings reported in the articles themselves and by the goals of this review. For example, the types of data reported in the studies prompted creation of categories such as locations where care was sought, types of treatments administered, and danger signs recognized by caregivers. Whereas the goals of this review, such as capturing local perceptions of illnesses and barriers to care-seeking led to creation of these respective categories.

Data were extracted from the dozens of included publications and entered into the data integration tables. Upon subsequent reads, categories were created or combined, further data extracted, and this process was continued and developed in order to best integrate the varied types of data and methods of reporting across a diverse body of evidence.

There is a lack of internationally shared language across health systems and public health research in different countries. Different types of health structures, health personnel, policies and programs exist in different country locations and different definitions and measures used by different researchers. As such, most findings could not be reported in a standard measure across studies. Data were integrated during the synthesis process and tabulated when possible to most succinctly and concisely summarize findings, however, such counts presented in this review are truly representative estimates at best.

One concern that arose during synthesis was how much or how little data would be extracted from every study. While each included study addressed a number of important questions and presents and number of potentially valuable and informative findings, not all could be incorporated into this review. Findings related to the topic of this review were first extracted, followed by main research questions that were main topics in the articles (when relevant to this review). Lastly, additional findings that could complement this topic were incorporated when possible.

Previous work undertaken by UNICEF named the "Demand-Side Barriers Framework" guided the categorization of relevant demand-side barriers presented in the literature (those that impede the initial and continued use of services) [12] . Within the data integration table that was developed to accommodate the synthesis, barriers were categorized according to the framework presented below (Table 2) and are further elaborated upon in the section entitled "Summary of Barriers to Care-seeking".

Financial barriers:
direct, indirect and opportunity costs of health treatments and related services, including user fees, informal fees, transportation costs to health centers, cost of medicine and other treatments or tests, and the cost of not working during time seeking or receiving care outside of the home
Education and information:
formal educational level of parents; knowledge individuals have regarding a particular disease: etiology, symptom recognition and treatment options; lack of knowledge of the existence of a given intervention ("don't know"), or not perceiving the intervention as acceptable or desirable ("don't want")
Distance and location of health facilities:
physical distance traveled to facilities; rural facilities suffer from chronic underinvestment, gaps in the skills mix and expertise of staff, gaps in types of services offered, as well as low quality of the services provided
Socio-cultural barriers and gender dynamics:
cultural, religious or social factors may affect care-seeking choices; control over household income and intra-household dynamics may impact investments in health and decision-making; infrastructure and delivery mechanisms in facilities may not be sensitive to socio-cultural characteristics; gender discrimination, low education levels, and a lack of empowerment may affect women's care-seeking choices

Table 2. Demand-side Barriers Framework Developed by UNICEF NY-HQ

Grey Literature

Grey literature was gathered by use of the Google search engine using both broad and specific concepts in child health, with further refinement using country names. Additional targeted searches of non-governmental organization (NGO) websites were performed using broad terms, illness terms and country locations; such websites included those for USAID, MSH, PATH, Save the Children, John Snow, and BASICS, among others. Relevant country offices were reached for referrals of sources for possible grey literature and additionally, documents were provided directly by country office staff and contacts at NGOs. The grey literature collected included white papers, technical reports, presentations, program evaluations and other documents. Relevant findings from grey literature were extracted in narrative form. The findings were incorporated into the review as a summary following the section on individual country. The one exception to this is the section on Niger, for which the majority of literature incorporated in the review was grey literature, provided to the author by a consultant to the UNICEF country office. All literature, both grey and peer-reviewed, concerning Niger is incorporated in narrative form within one single country section on Niger.

Summary of Literature Identified

A total of 65 published articles were selected for inclusion in this report. Topics of the studies focused on childhood diarrhea, malaria or pneumonia, or response to childhood illnesses in general. In addition, peripheral concepts that may influence care-seeking behavior were also captured; one example of this is literature on childhood illnesses believed to be caused by teething. The numbers of articles gathered on each illness are represented in the table below (Table 3), with the majority of studies across all countries looking at malaria.

Location	Illness			
	Diarrhea	Malaria	ARI	Other
Ethiopia	0	9	0	0
Kenya	6	12	7	1 · tooth gauging
Niger	1	0	0	0
Nigeria	3	14	2	3 · drug color · teething · pain
Uganda	2	16	5	2 · tooth gauging · tooth illness
All countries	12	51	14	6

Table 3. Topics and Locations of Studies in the Published Literature

Note: Studies examining multiple illness topics are represented in each respective category.
Studies taking place in more than one country are represented in each country location where data was collected.

Overall, 44 studies were quantitative, exploring topics like health-seeking behavior, knowledge/ attitudes/ practices, risk factors for illness, causes of delays in care-seeking, and dozens of other topics. Eleven studies utilized mixed methods, or both qualitative and quantitative methodologies. Ten studies were solely qualitative in nature, using mostly focus group discussions and interviews to examine subjects like illness concepts and perceptions surrounding illness etiologies, and to gain an understanding of care-seeking behaviors and treatment preferences.

RESULTS

Findings are presented for each country individually in the following chapters of this report. Results are further divided into sections by disease area, such as pneumonia or diarrhea. Findings from those studies that explored multiple illnesses or childhood illness in general are presented in a separate section. Except, for Niger, the limited data compiled on both diarrhea and general childhood illness is combined in one section. Exceptions to this include the country findings from Ethiopia, as they discuss solely malaria.

Ethiopia

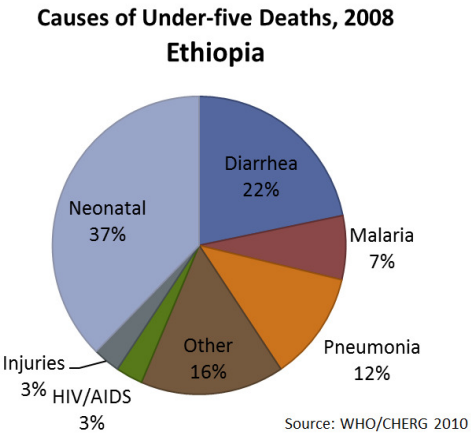

Figure 3. Pie Chart of Causes of Under-five Deaths in Ethiopia

Ethiopia is home to roughly 83 million people, in an area covering one million square kilometers of land. Eighty-two percent of the population lives in rural areas. A mere one-third of adults are literate [13]. About one in every ten children (109/1000) will die before their fifth birthday [14], and more than half of all children under five in Ethiopia suffer from moderate or severe stunting [15]. The leading causes of death for children ages one month to 59 months are diarrhea (22%), followed by pneumonia (12%) and malaria (7%) (Figure 3) and appropriate response to childhood illness is low (Figure 4).

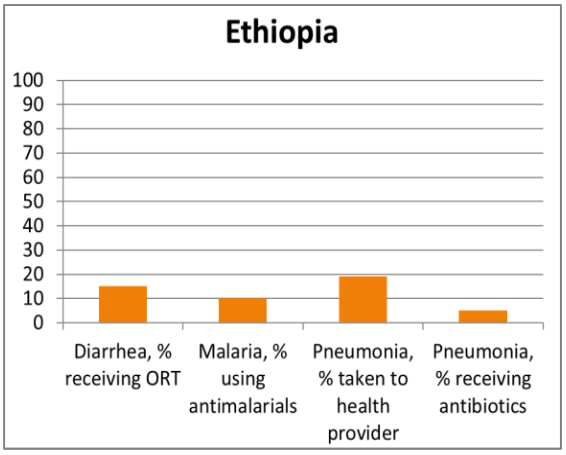

Figure 4. Bar graph representing percent of caregivers responding appropriately to childhood illness in Ethiopia

Description of Published Studies from Ethiopia

Published reports selected for inclusion from Ethiopia focused on malaria. Five of these nine studies were carried out in central parts of Ethiopia, two in the south-western part of the country and two were covering the whole nation (Figure 5). Eight studies were household-based, while one study targeted health centers. All studies but one took place in primarily rural areas whereas one studied households in a

town. The study populations consisted of mothers of children under five years of age, fathers and key informants. The samples of the five studies from the central parts were largely overlapping and the two national studies were based on the same sample. This has been taken into account when calculating the total number of participants in all studies: a total of 13,123 households participated with 9,426 children under the age of five. The number of children under-five included in one of the studies was not presented.

The topics of the reports were prevalence of malaria, effectiveness of home management of malaria, knowledge and use of insecticide treated nets (ITNs), perceptions surrounding malaria etiology and prevention, treatment seeking behaviors and reasons for delay in treatment.

Figure 5. Map of Ethiopia Depicting Included Studies

Most studies were cross-sectional. One study used a case-control design and one was a pre- and post-intervention study. Seven studies were quantitative, and two employed mixed quantitative and qualitative methodologies. Data was collected using structured interviews, focus group discussions and interviews with informants.

Note Bene: Geographical samples in these studies are represented by circles on the maps in approximate locations. Studies with samples in multiple locations are represented by multiple circles, and nationally representative studies are not depicted.

Perceptions of Childhood Malaria

Caregivers in general in Ethiopia were describe overall as having a strong perception and knowledge of symptoms of malaria, however, in one study, only 80% of surveyed women had heard of malaria, and only 51% recognized fever as a sign of malaria [16]. Similarly, only 41% of mothers in that particular study recognized mosquito bites as the cause of malaria, with 38% citing mosquito nets as a prevention method for malaria [16]. So, while the concept of malaria may be popularly known, to increase common

knowledge of symptoms of this illness remain an area of potential focus for educational interventions. However, caregivers' knowledge about the role of mosquitoes on the transmission of malaria was not associated with timely and appropriate help-seeking behavior for children, though such knowledge may promote personal protective measures [17].

Management of the Febrile Child

Home-diagnosis was common for children with suspected malaria, but when it comes to treatment, very few, only about 1 in 20 children, received care at home [18]. Home treatment did equate with prompt treatment, with the majority of children who received home care taking it on the first day of the onset of illness [19]. Response to illness in the home included children being sponged, given herbal preparations, or orthodox medications obtained from chemists or shops [20].

Of care-seeking outside the home, roughly a quarter of the children in the rural setting visited CHWs as a first source of anti-malarial treatment children, a quarter were first taken to a public facility (health center or health post), and a quarter sought care at private clinics [19]. In general, private facilities were preferred as they reportedly provided prompt diagnosis and timely treatment, they were proximate, and were felt to be more responsible and more accountable than the services provided in the public sector. Higher cost clinics were also perceived as giving better care [21].

Secondary treatment choices were reported among a rural population. Among children who visited CHWs as a first source of treatment, most sought care subsequently from private clinics or public facilities. While relatively few children (18%) first seen at public facilities sought a second source of treatment, even fewer children (11%) who sought care at private clinics visited a second source for anti-malarial treatment [19].

A majority of cases of suspected malaria were treated outside conventional public health facilities [16, 19, 22] necessitating the need to strengthen both community-based interventions and peripheral public and private facilities.

In the urban setting, community medicine distributors were infrequently accessed for care. Caregivers in the urban setting of Jimma stated a preference for community medicine distributors (CMDs) for childhood malaria treatment because services were available in the neighborhood and were quickly performed, yet only 7% of caregivers actually used the CMD. In Hirmata market area, mothers preferentially took their children to the health center rather than seeking the help of CMDs citing that they were conditioned to seek care at the health center or that they lacked confidence with the CMDs [20]. Maintaining motivation of CMDs was perceived as a challenge but essential for sustaining pre-packs of ACTs in the community and thus, for subsequent success of community-case-management. Reasons preventing more use of CMDs in the urban setting were unclear, but might have been attributed to an unsuccessful information, education and communication program, socio-cultural barriers that were not addressed, or competing health care providers in the area [20].

Reasons for Delay in Care-seeking

Mothers who complained about the side effects of drugs were more likely to have delayed care-seeking [17]. Caregivers may perceive that the side effects of anti-malaria drugs are harmful and outweigh their benefits, pointing to a need for better education and counseling from providers to correct this.

Mothers who suffered a previous under-five death were likely to seek treatment earlier, suggesting that perceived risk and severity of the illness motivates prompt care-seeking [17].

Children of monogamous parents were three times more likely to delay in seeking diagnosis and treatment for malaria when compared to children who had polygamous parents. In polygamous households, decision-making concerning children's health may be in the hands of the mother, who promptly chooses to seek care. Polygamous families may also have better income than monogamous families, increasing the likelihood of bringing sick children to the health facility earlier [17].

Distance and Location of Services

As the cost of transportation increases, the delay in care-seeking increases. About 10% of the participants in one study attributed delay in seeking care to distance to a health facility [19]. Another study noted that mothers who lived in a village more than three kilometers from a health center were more likely to delay treatment of malaria for under-five children than mothers who live less than three kilometers away [17]. Similarly, choices in source of care reflect distance as a barrier; reasons for preference for private facilities included the fact that private clinics were nearby in the community [20]. And a perceived positive attribute of CMDs, as mentioned previously, was their availability in the community [20].

Poverty and Financial Barriers

Care is sought subject to affordability. Socioeconomic status (SES) was associated with method of treatment provided and healthcare seeking decisions, with those in the lowest SES going to CHWs and using home treatment [23]. Demand for healthcare was positively related to having a source of money for health care [20]. A major problem in the urban poor study sites was poverty. In Ethiopia, a participant noted: "We are living in abject poverty. Thus, financial insecurity has curtailed our ability to buy drugs, food items and meet other extra costs when our children are ill" [20]. Financial constraints negatively affected the speed of seeking care, and as well, costs of transportation were reported to be a limiting factor.

Programmatic Implications for Malaria in Ethiopia

Summary of Programmatic Implications for Malaria in Ethiopia

1. Strengthen community-based interventions to improve home care and care-seeking
2. Effective antimalarials need to be within reach of the community; access needs to be improved at the lowest levels.
3. Community Health Workers are a valuable source of access to antimalarials: Encourage better treatment seeking to CHWs and better practices among CHWs.

4. Rapid diagnostic tests (RDTs) could improve case management and surveillance in areas of seasonal malaria transmission.
5. Appropriate and relevant information on malaria should be disseminated throughout the local community.
6. A long-term focus on improving geographic and economic access to facility-based care could ensure demand for appropriate treatments

1. Strengthen community based interventions to encourage home treatment and care-seeking

Patients use multiple sources of health care for malaria treatment. Public health facilities, private clinics and community health workers were the main providers of malaria treatment. In a seasonal transmission area of Ethiopia, the first response to suspected malaria was seeking care from outside the home. While nearly half of the mothers first sought treatment for malaria from a public health facility, the rest turn to other sources like CHWs and private providers as a first resort [18, 22]. Despite higher treatment costs, reason for preferring to use private health care providers for malaria treatment was attributed to the higher perceived quality of care [21]. This points to the importance of strengthening community-based interventions and peripheral health facilities and improving access to health services by working in partnership with private healthcare providers [18].

While private providers were commonly sought, private care is unaffordable for the majority of patients seeking care [21]. An approach involving voucher schemes or subsidies might allow better access to this source of care in the most remote rural areas where public services are inaccessible to patients in need.

Home treatment of malaria for children was low and the provision of both sub-therapeutic and over dosage were common [19]. Often, multiple visits by febrile children to different care providers were made. These facts necessitate improvements in quality of care and/or of the efficacy of treatment received from CHWs, public health facilities and private clinics [19]. Of note, sulfadoxine-pyrimethamine (SP) and chloroquine were the most available anti-malarial drugs, and artemether-lumefantrine was reportedly not easily accessible at the time of these studies [19].

2. Effective antimalarials need to be within reach of the community; access needs to be improved at the lowest levels.

To improve early and appropriate treatment, the provision of effective anti-malarial drugs such as artemether-lumefantrine within the reach of the community is critical. Access to drugs needs to be improved at the lowest facilities/grassroots level/ among CHWs and extension workers [17]. The supply of effective antimalarial drugs to the commonly-used care providers, public or private, is essential.

Home treatment was still the most prompt form of care provided to sick children, and as such, manners by which improved home care can be scaled up are valuable. Delays in seeking treatment for malaria was

most common among the users of public health facilities, followed by the users of private clinics, when compared to the users of CHWs and home treatment [18]. However, given the reported limited availability of first-line drugs, wider accessibility and ensured availability of ACTs are a priority for scaling-up home care. Drugs should preferably be subsidized or free of charge. Improving community-based interventions that deploy CHWs to administer anti-malarial drugs may be a way to help improve access [19].

3. Community Health Workers are a valuable source of access to antimalarials: Encourage better treatment seeking to CHWs and better practices among CHWs.

While using SP and chloroquine at the community level were seen with great hope to reduce the burden of malaria, this strategy is compromised due to lack of an effective, cheap, and easy–to-administer drug at this time. Health extension workers in the communities who can distribute ACTS at the grassroots level have a strong potential for reaching greater areas with free care and effective medicines. For greater success of community extension workers, they may need to become more familiar with and more trusted by the caregivers in the area they serve [20]. Provision of increased or continuing education to CHWs could encourage better confidence, better practices and better respect in the communities they serve. Considering the proportion of visits made to CHWs [18, 22], improvements along this front are valuable.

4. RDTs could improve case management and surveillance in areas of seasonal malaria transmission.

Despite low levels of home treatment in areas of seasonal transmission of malaria in Ethiopia, use of health services is widely practiced [18]. In such a setting, where the magnitude of asymptomatic carriers is presumably low and where the majority of febrile children present for care outside the home, the use of RDTs may be valuable for identifying cases and improving case management. Enabling CHWs to provide diagnostics for malaria using RDTs may be very feasible in areas with seasonal transmission. This may also prove dually valuable as an approach for active detection of outbreaks.

Even with a long history of epidemics, malaria transmission is suspected to become increasingly more focal in Ethiopia [16]. As approaches to reduce transmission are preferred over coordinating responses to outbreaks, strengthened surveillance at the community level through passive and active case detection by community health extension workers could be valuable in both moderate and low transmission settings.

5. Appropriate and relevant information on malaria should be disseminated throughout the local community.

Even if efficient and high quality services are offered, the desired health outcome will not be achieved if the services are not timely and properly utilized by care seekers [21]. To achieve improved coverage, programs need to incorporate effective messages to promote behavioral change [24]. The community should be informed about the importance of early diagnosis and the provision of prompt treatment with effective antimalarials [17, 22].

The caregiver's perceived severity of the illness may affect treatment-seeking behaviors [17] and so the potential serious nature of the illness and the risks for delays in treatment should be conveyed. It is imperative to develop appropriate educational materials oriented towards strengthening knowledge and sustaining practices of early diagnosis and treatment for malaria [19]. Home treatment and the use of herbal/traditional remedies were found to be very low [22] and capitalizing on the patterns of care-seeking outside the home, a bit more guidance to encourage prompt care outside the home (within 24 hours of symptoms) may be well-received. This type of intervention would also be an appropriate avenue to address patients concerns about the side effects of anti-malarial drugs [17].

Health education and promotion may take place both at the community and individual level, through channels such as mass media, schools, community meetings, vaccination campaigns and local health workers [21]. Malaria information could also be made available to caregivers visiting child welfare clinics [18].

Although knowledge is one aspect of a complex interplay of factors, it is an important prerequisite for instigating behavior change and could likely inform attitudes about malaria health- related behaviors. Efforts to control malaria could be integrated with progress towards broader goals of improving access to education, especially for women. A strategy based on a girl- or woman-centered approach, is proposed as an effective way of increasing the emphasis on girl's education and delivering health messages to this potentially receptive population [25].

6. A long-term focus on improving geographic and economic access to facility-based care could ensure demand for appropriate treatments.

In the long run, improved access to facility-based diagnostics and treatments is desired, especially for those in the most rural areas where access is currently most limited [19]. Healthcare provided by a qualified practitioner with access to modern diagnostics is the most appropriate care for a sick child. As distance to the health facility is a barrier to care-seeking, a manner by which transport cost could be reduced would be a valuable enabler of better care-seeking [17].

Findings from Grey Literature

The results of surveys presented in the grey literature on Ethiopia suggested that care was sought for just 2/5 cases of childhood febrile illness. A small percent of these cases were febrile children who received an antimalarial the same day as fever onset. Of these few cases receiving prompt and appropriate care, the largest percent of them sought care from a private facility (more than one-third), with one-quarter receiving care at a government health facility and less than 7% of those receiving prompt appropriate treatment seeing a health extension worker. Great strides could be made to improve access to affordable and accessible care.

About half of childhood deaths in Ethiopia result from pneumonia or diarrhea. Ethiopia has one of the lowest levels of care-seeking for acute respiratory infection (ARI) compared to other countries and a low percentage of children with diarrhea receive ORS. For ARI, nearly 85% do not seek care, and on average, 74% of diarrhea cases did not seek care. Broken up on the richest and poorest quintiles, 57 % among the richest did not seek treatment and 79% of the poorest did not seek care. While there is a divide among care-seeking for the richest and poorest, care-seeking even among the richest is quite low.

Geographic access to health care influence care-seeking, so urban households are more likely to seek care than households in rural areas. One explanation to this is that transportation costs represent a high proportion of health care costs. The average distance to a health facility in rural areas was 7.7 km compared to 1.4 km in urban areas. Only 40% of households have access to care that is less than 5 km away. This is important because the two main reasons for choosing a facility are availability/access and quality of care, availability being more important for poorer households and quality being more important for richer households. Households in the poorest quintile are more likely to use public clinics, pharmacies and other trained private providers instead of public hospitals, though in some districts, the poor are around half as likely to seek care for illness. Reasons for not seeking care included lack of finances for treatment (half of respondents), distance to facility (quarter of respondents) and not perceiving their illness to be serious.

An intervention to promote ORS treatment found improvements during the same time period even in districts not receiving the intervention. At the same time, the incidence of fever, diarrhea, cough and difficulty breathing decreased.

A report looking at care-seeking in childhood illness found that only one quarter of children with ARI took an antibiotic. Of children with fever, one quarter took an antibiotic and 5% took an antimalarial. And for diarrhea, just less than 40% were taken to a health facility with just more than 40% in total receiving ORT.

Overall, an inexpensive and effective treatment like oral rehydration therapy (ORT) is largely under-utilized and the potential for improvement in the use of this low cost and low technology intervention is very large. Antimalarial treatments can reduce child mortality effectively if targeted to geographical areas where prevalence is high. Although pneumonia is a major cause of death, due to low efficacy of available drugs for home based treatment, interventions might have a lower impact. Interventions should also target health care accessibility and increased quality of care.

Kenya

Kenya's population is just over 40 million people, inhabiting an area of around 570,000 square kilometers. Seventy-eight percent of the population lives in rural areas. Eighty-seven percent of the adult population is literate. The current under-five mortality rate is (85/1000) [13]. Diarrhea (20%), pneumonia (15%) and malaria (11%) are the leading causes of death for children under five in Kenya (Figure6) [2]. In the most recent DHS, less than one quarter of febrile children reported receive antimalarials, and just over half of all children with suspected pneumonia are brought to an appropriate health care provider (Figure7) [26]. Only one-third of children with diarrhea received ORT or increased fluids in addition to continued feeding [27]**.** Thirty-five percent of children under five suffer from moderate or severe stunting.

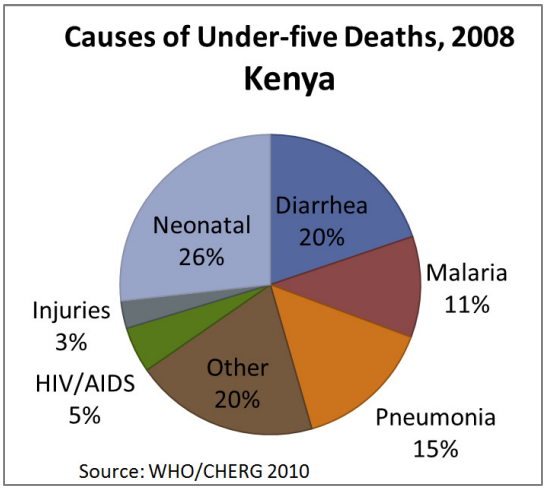

Figure 6. Pie Chart of Causes of Under-five Deaths in Kenya

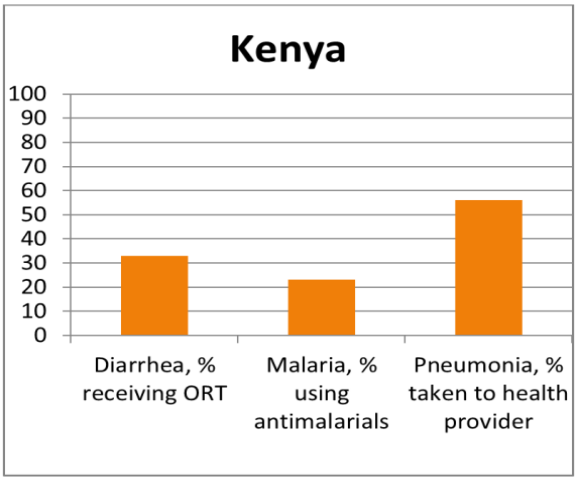

Figure 7. Bar graph representing percent of caregivers responding appropriately to childhood illness in Kenya

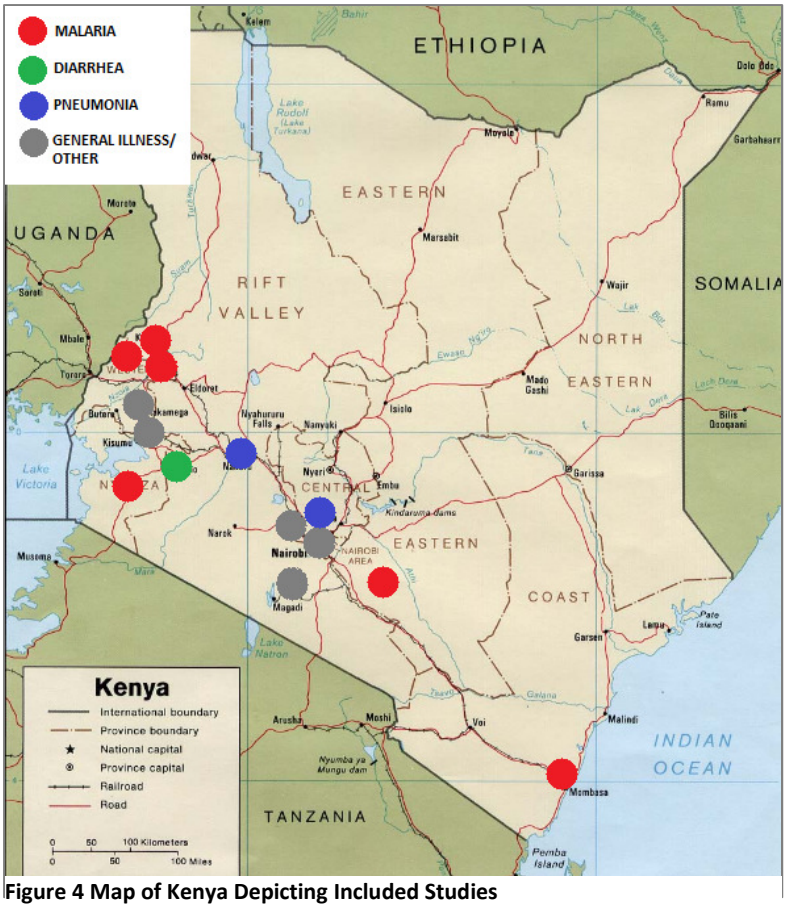

Figure 4 Map of Kenya Depicting Included Studies

Description of Published Studies from Kenya

Eight of the published studies were from southern, 8 from western and 1 from north-central Kenya. Eighteen studies collected data from households and 1 targeted health centers. Thirteen studies were from rural areas and 5 from urban areas. All study populations consisted of mothers or caregivers of children less than 5 years of age. A total of 56,729 households participated with 47,043 children under the age of 5. Seven studies investigated malaria, two examined pneumonia or ARI and one

study focused on diarrhea (Figure 8). Seven additional studies were on general or multiple childhood illnesses, and one study looked at tooth bud removal and its perceived relation to childhood illnesses. The topics explored in these papers included knowledge and care-seeking for children with malaria or with diarrhea, caregivers' knowledge of pneumonia, and determinants and barriers to accessing health care in slums. Eleven of the studies were quantitative, three were qualitative, and four used both methodologies. The studies used structured or semi-structured interviews, focus group discussions and in-depth interviews with key informants to collect data. Most studies were cross-sectional, while one study was longitudinal.

Childhood Illness in General

Management

In the rural countryside of Kenya, treating children at home with shop-bought medicines was found to be common practice. One-third of mothers bought drugs and treated their sick children at home without seeking further care for them. Most commonly cited reasons for this were the distance of government health facilities, and poor quality of care and expensive services provided by private hospitals and clinics [28].

Healthcare seeking at health facilities and hospitals varied by syndrome and perceived severity of the illness. Caregivers sought medical care more frequently for diarrhea symptoms than for coughing, and care-seeking was most common for sick children in the youngest age group (0–11 months). Caregivers also chose to use place of treatment where cost could be negotiated. Private health facilities were often selected against due to expense and under training.

Within the Kibera slum, health care was sought outside of home for 60% of sick children [29]. Shops and chemists were most frequently sought [29], followed by private facilities, with fewer to public facilities, and even less consulting traditional healers [30]. Clinics run by faith-based institutions were popular, whereas public clinics and hospitals, located outside of the community, and were not as frequently sought [29]. Failure to seek care outside the home was commonly attributed to a lack of finances and the perception that illness was not serious [29]. Certain illnesses, like coughs, colds and diarrhea were perceived as not serious. Malaria was perceived as serious, but not life-threatening. While pneumonia was perceived as serious, illnesses that appeared chronic, like chronic coughs, were not believed to require immediate action [29]. Many mothers reportedly take a "wait and see" approach, delaying two or three days before seeking treatment [30].

A number of obstacles were cited by those seeking care at a public health center for their sick child. Long waiting times, lack of drugs, poor services, incompetence and perceived poor attitudes of the health workers were cited [31]. Wide-spread concerns and misconceptions were revealed about health care and its provision among the caregivers [31]. The implications of this were reflected in the perception of quality of care received at the health facility.

Gender and Social Norms

Household members direct decisions made regarding treatment seeking behavior. Some mothers reported that they knew that their child had malaria from other women. It was described that healers were sought

in some cases of sickness as required by head of household or family. In one report, mothers received financial or advisory assistance from others in 71% of actions taken outside household; treatment seeking behaviors were circumscribed by these relations [32].

Distance and Financial Barriers

The distance of government health facilities was a common reason for mothers to purchase and administer drugs within the home [28, 33].

Another reason for mothers to purchase and administer drugs herself was the inability to afford services at the private hospitals and clinics. Socioeconomic status was significantly associated with health care seeking at a facility. Lack of finances was a main reason given for failure to seek health care outside the home, and also the most common reason cited for not proceeding to the hospital after being referred there.

Childhood Pneumonia

Perceptions of Pneumonia

Less than one-fifth of mothers could describe pneumonia satisfactorily, while 80% described it as fever with no respiratory association [34]. Nearly 90% of respondents believed pneumonia to be caused by cold weather and thought avoiding cold conditions would prevent it [34]. In that study population, nearly all in that study knew cough could develop into serious disease. In another study, pneumonia was perceived to be the most serious childhood illness, yet non-severe pneumonia was not recognized as potentially dangerous [35]. Such mistaken perceptions regarding cause of pneumonia and the lack of understanding of signs and risks of non-severe pneumonia may hinder compliance with home care messages.

Management of Pneumonia

For pneumonia in the preceding 12 months, all caregivers sought healthcare outside the home, with half presenting to a hospital. Village health volunteers and traditional healers were rarely consulted. For ARI, the majority sought treatment from drug sellers, while 18% went to the hospital, and one-quarter to private providers [36].

Informants cited various reasons for delay of care: ignorance, financial, geographical, social and religious; but they asserted that they would seek immediate health care for child if pneumonia is suspected [35]. Disconcertingly, fast breathing is not recognized as a symptom of pneumonia, which may delay treatment until symptoms are severe. For acute respiratory infection, mothers had good knowledge of mild forms, but not severe forms [34]. The low utilization of health services for moderate ARI most likely results in continued high mortality due to delayed provision of treatment.

Childhood Malaria

Perceptions of Malaria

Malaria was often recognized by symptoms of headache, fever, cold, body or joint pain and loss of appetite. In the febrile child, additional symptoms that caregivers associated with malaria were cough, shaking, chills, poor appetite and headache [37].

Malaria was associated with mosquitoes by a majority of mothers across studies. In one study, a second most common cause of malaria was cold weather (54%) and accordingly, malaria was most commonly believed to be prevented by antimalarial drugs (35%) and warm clothes (25%). Only 17% of these caregivers offered that bednets were a means of preventing the disease [37].

There was a lack of understanding that malaria is a single disease and more than half reported in one study that the term used for malaria covered a number of diseases. The fact that a high percent of this population understanding that malaria was associated with the bite of a mosquito was attributed to local vernacular radio with promotional messages and community meetings [38]. Though, while 92% of mothers recognized mosquitoes as causing malaria, still 30% associated malaria with dirt (dirty compounds, dirty utensils, unboiled water and uncooked foods) indicating that while malaria was associated with mosquitoes, the biomedical concept of malaria solely being caused by mosquitoes was not understood [38].

It was found that in one setting, mothers referred to nearly all cases of childhood fever as malaria, with roughly 50% of children having reported malaria on the day of the study [39]. This was during the low rainfall/low-infectivity season and likely represented the mother's interpretation of the term for malaria to mean fever, or that all cases of fever are believed to be malaria. The implications of either scenario are detrimental and need to be corrected so that true cases of the potentially serious illness are not easily dismissed as just common fever. In another study, recognition of malaria signs and symptoms did not equate with care-seeking behavior. Even in the case when the mother recognized the symptoms of malaria in her child, and knew the illness was caused by mosquitoes, this did not necessitate seeking outside care or looking to obtain anti-malarial treatment. Rather, the illness was not perceived to be severe [40].

Management of Malaria

In Bungoma district, most antimalarials used for home treatment were bought from pharmacies (54%) or small shops (29%); 9% were obtained from health facilities at an earlier visit for another illness [37]. In a second study in Butere District, more than half of antimalarials obtained for home treatment came from shops, with one quarter from government hospitals [31]. Of the antimalarial treatments given at home, 91% were started by the second day of fever and 92% were with chloroquine, the nationally recommended antimalarial at the time, and reportedly home treatment with an antimalarial was given to 47% of children [37]. Another study, however, found that of mothers who did not take the child to hospital, only 13.2% of treated with antimalarial drugs [41]. Children receiving home care receive an anti-malarial treatment more promptly than those seeking care at a facility [37].

Care at formal health facilities was reported in about one-third or more of cases [28, 37]. One study reported care sought at the informal retail sector in 41% of cases.

Febrile children were more likely to be given an antipyretic than an antimalarial treatment [37, 42]. Adults were more likely to buy antimalarials to treat their own illnesses than children were to receive these for febrile illnesses. The most widely dispensed medications were antipyretics/ analgesics (52%) followed by antimalarials (31%). More than half of fevers treated through the formal public sector received an antimalarial drug. At private clinics, retail outlets or at home, 50%, 33%, and 16%, respectively, received an antimalarial.

Most common antimalarials purchased over-the-counter were the Ministry of Health (MOH) first and second line recommended medicines, SP and amodiaquine (AQ) with many remaining cases receiving chloroquine [42]. Single dose SP was used satisfactorily by nearly half of children. Multiple dose AQ was generally given incorrectly as a single dose with only 12% of children receiving adequate dose for their illness [42]. Use of syrup resulted in lower dosages than tablets and almost two-thirds of children seen at health facilities received injections [37].

The majority of caregivers do not complete the course of antimalarials prescribed. Of the caregivers who took their children to a health facility, 58% reported that they had medication left over after treatment ceased [37].

Childhood Diarrhea

Perceptions of Diarrhea

Perceived causes of diarrhea included unclean water (56%), contaminated food (55%), bad eye (50%), false teeth (46%) and breast milk (36%) [43]. Canine tooth buds are associated with bad spirits that cause diarrhea and vomiting and removing them is ascribed to cure children's ailments. The practice of removal of children's tooth buds was described as initially starting with calves; diseases causing diarrhea in calves were brought on by the canine tooth buds turning reddish. This practice of tooth bud extraction to prevent or treat childhood illness remains deeply rooted and widely practiced despite sensitization efforts [44].

Management of Diarrhea

In treating diarrhea at home, nearly half of caregivers administered an antidiarrheal drug, 13% gave ORS, 19% gave homemade fluids, and 8% gave herbal medicine. Mothers reported that they stopped giving child medicine on improvement of conditions under the misconception that too much medicine in child's body was not safe [43].

The mothers perceived wheat flour, rice water and selected herbs as anti-diarrheal agents. But mothers withheld foods and fluids wrongly perceived to be associated with diarrhea. More than 70% of mothers decreased fluid intake during diarrhea episodes: more than one-quarter of children were reported not to have drunk any fluids at all, with only 10% reported to have drunk more than usual. A significant 90% of mothers withheld milk, including breast milk, under the impression that it enhanced diarrhea [43].

Summary of Programmatic Implications

1. Distance plays a role in determining care seeking at facilities in rural areas: efforts must minimize geographical (and financial) barriers to care-seeking.
2. Care-seeking tendencies differ in rural and urban settings: there was a three-fold greater reported use of herbs or prayers for childhood illness in the urban setting.
3. Caregiver education must improve recognition of severe symptoms and improving promptness of care-seeking for all childhood illness.
4. Valuable opportunities exist for educating caregivers who are seeking help at facilities
5. Continued and interactive educational interventions in the community are needed to maintain appropriate home treatment and discourage dangerous practices. Recognition of serious symptoms needs to be improved.
6. For febrile illness, caregiver education must align the local terminology used with the biomedical concepts of disease and suggest appropriate response to symptoms.
7. Home management for malaria must be strengthened with caregiver education and improved provision of antimalarials.
8. Target the retail drug sellers with educational interventions to improve demand for appropriate treatments.

General Childhood Illness

1. Distance plays a role in determining care seeking at facilities in rural areas: efforts must minimize geographical (and financial) barriers to care-seeking.

Two studies report that proximity to the health center and availability of funds/socio-economic status are associated with care seeking at a facility or are reason for alternative health seeking behavior [28, 36]. Within rural Kenya, distance of residence to healthcare facilities played a larger role in health-seeking behavior than in urban areas like in the informal settlements in Nairobi [45]. In rural areas, even in hospitals where care is free and drug supply was readily available, care was much more often sought from other sources, presumably more easily accessible [33]. With limited options for transportation and competing priorities at home, the time that can be allotted to traveling for a clinic visit seems is limited. Within one study population, where every household was within 5km of a hospital, there was a four-fold drop-off for clinic use for those households 4km away compared to those that were 1km from the referral center [33].

In one rural population of mostly sugarcane farmers, factors attributed to enabling health seeking included proximity to the health facility, health insurance, income and existence of social networks [28]. Many in that study area depend on the sugarcane payments made in a lump sum, years after planting the crop.

Smaller payments spread out over longer periods of time, or the potential for alternative sources of income, may allow for basic household needs such as medical care to be easier met [28].

2. Care-seeking tendencies differ in rural and urban settings: there was a three-fold greater reported use of herbs or prayers for childhood illness in the urban setting.

The proportions of children reporting diarrheal and respiratory diseases were higher in urban areas, as were proportions of patients seeking care at clinics. Risk for illness may be related to residing in densely-populated environments with sub-optimal sanitation, but differences in care-seeking may potentially be attributed to different tendencies concerning illness recognition or care-seeking in urban versus rural settings [45]. Caregivers of children in the urban setting were more likely to report use of herbal medicines (34-40%) or prayers for healing (26-40%) - nearly three times higher than in most of the studies in rural settings [36]. This may be solely attributed to differences in reporting by caregivers, or it may actually reflect practices. Access to public health care may be very difficult In the urban slums, access to child health services might be improved by engaging community-based organizations and by working in partnership with private providers to increase skills, access to resources and supportive supervision [29]. Strategies must be developed to ensure that the increasing number of urban residents has optimal access to healthcare and treatment, and sufficient knowledge to guide their treatment decisions.

3. Caregiver education must improve recognition of severe symptoms and improving promptness of care-seeking for all childhood illness.

Community-based caregiver education efforts would ideally increase the caregiver's ability to recognize danger signs in child illnesses and facilitate behavior change in health care seeking [29]. There is a great need to train mothers to recognize potentially life-threatening conditions and to seek appropriate treatment promptly [30]. Perceived severity of illness is independently associated with seeking care at a facility - pointing to the importance of educating caregivers to recognize severe symptoms [36].

As mentioned above, the differences in the rural versus urban setting are dramatic when considering the three-fold difference in likeliness that a sick child will receive herbal medicines or prayer for healing in

the urban setting [36]. This suggests that educational interventions for caregivers in urban settings may differ from educational interventions to improve care-seeking in the rural setting.

One serious and dangerous practice that needs to be corrected is removal of children's tooth buds under the belief it will prevent childhood illnesses. While tooth bud extraction is a deeply-rooted socio-cultural practice, caregiver education needs to remove the misconceptions that lead parents to attribute childhood illness to tooth buds. Community-based efforts might suggest more appropriate approaches while appealing to the parents' desire to alleviate their child's suffering [44].

4. Valuable opportunities exist for educating caregivers who are seeking help at facilities - especially to encourage completion of the course of treatment prescribed.

A large number of patients visiting the referral facility reported having taken medication previously obtained at the same clinic- suggesting the patients never completed the full course of medication prescribed for a previous illness. It is frequently observed practice, that, rather than to finish the course of treatment after seeing improvement in symptoms, a caregiver may save some of the medicine to use for the next case of illness in the family [33, 37]. Such practices are common and dangerous, increasing likeliness for under-treatment and the potential for relapse. Education when caregivers present at the facility or when prescribed the drugs could convey the importance of adherence and risks associated with incomplete or inadequate treatment.

Diarrhea

5. Continued and interactive educational interventions in the community are needed to maintain appropriate home treatment and discourage dangerous practices. Recognition of serious symptoms needs to be improved.

Caregiver education regarding home treatment of diarrhea is essential and needs to be scaled up and sustained. Mothers and caregivers have diverse perceptions on causes and treatment of diarrhea, some of which can be extremely dangerous for a child. Often caregivers are unable to recognize signs of dehydration, and the use of anti-diarrheal drugs to stop diarrhea is common [43]. However, some reported practices such as use of home fluids are valuable, and need to be maintained and more widely

adopted. On the other hand, dangerous practices that were reported, such as withholding foods and fluids, need to be eliminated. There is need to implement interactive communication strategies among caregivers and health workers at the community level in order to enable sustainable positive changes in home management practices [43]. Communications strategies need to incorporate the cultural influences that affect mothers' treatment choices. Efforts also need to be made to ensure that caregivers comply with the drug dosage and completing the full regimen to minimize development of resistance [43].

Febrile illness

6. For febrile illness, caregiver education must align the local terminology used with the biomedical concepts of disease and suggest appropriate response to symptoms.

Community health education is required to empower the caretaker with an understanding to appreciate and recognize signs and symptoms of pneumonia as well as understand the appropriate supportive care. This will enable the caretaker to better perceive the serious nature of childhood pneumonia, and improve adherence to health care messages. Identification of strengths and weaknesses in community perception of pneumonia will be important to incorporate [35].

One study community was familiar with and used medical terms like pneumonia, malaria and bronchopneumonia. However the signs, symptoms and treatment for each of these illnesses differed considerably from the biomedical concept. For example, mild pneumonia, that in biomedical terms refers to an illness that requires antibiotic treatment, was regarded as a mild illness that could be treated with antipyretics or anti-malarial [35]. In another study area, pneumonia was a term used as a label for fever rather than actual disease [46]. While health workers and the caretakers may be using the same words, their understanding of these terms may differ. It is imperative that such misconceptions are corrected in order to promote appropriate response to such a potentially serious illness by seeking care outside the home and treatment with antibiotics.

Maternal treatment-seeking patterns for febrile illness are influenced by perceptions of illness causation and severity. However, intra-household relations interact with and influence these factors to various extents and in complex ways, and these considerations must be taken into account when designing educational interventions to influence this population [32].

7. Home management for malaria must be strengthened with caregiver education and improved provision of antimalarials.

Most people seek treatment for febrile illness outside the formal health sector, and as such, there is great need for measures to improve fever management practices at home [47]. Caregivers may find it difficult

to take children to health facilities because of distance or financial constraints or competing priorities at home. Home treatment enhances the promptness of antimalarial treatment [37], and likeliness of children receiving any treatment when reaching a health facility. Although caregivers are major and prompt providers of antimalarial treatment, this practice needs to be encouraged and supported with education and improved access to appropriate drugs. Problems include the treatment regimen may not being completed, and analgesics being the most common drug used to treat malaria in children. This practice potentially delay seeking appropriate treatment [41]. In order to improve the success of home treatment, caregivers must be redirected to administer an antimalarial to all children with fever [37].

Despite national educational messages, many caregivers providing home treatment with chloroquine gave inadequate doses, while others gave potentially toxic doses. Administration of chloroquine syrup was much more likely to be sub-therapeutic than that of chloroquine tablets. Just as SP showed much promise due to its simple dosage regime, another effective therapeutic with simple dosage would make compliance easier [37].

8. Target the retail drug sellers with educational interventions to improve demand for appropriate treatments.

A self-sustaining system for the distribution of antimalarial drugs exists in many communities across the country: shops and pharmacies. Most treatment for febrile illness takes place outside of the formal sector [47]. Educating shop keepers and drug sellers is one approach to encourage appropriate use of drugs and improve home treatment practices. Drug shops and chemists, is a most common [33, 48] and accessible [37] source of drugs. Drug sellers are critical in the management of childhood illnesses for a number of reasons: some are available 24 hours, they are affordable, geographically accessible and offer a smaller social distance between the provider and the client. There is however a critical need to monitor the prescribing practices of drug retailers and encourage better practices, like stocking appropriate drugs and providing appropriate advice to care-seekers [30]. Messages for improving practices among drug sellers could concentrate on suggesting treatment of all febrile children with an effective antimalarial drug, administration of correct dosages, completing the full drug regimen, the avoidance of unnecessary injections, and recognition and referral of patients who develop severe symptoms or adverse drug reactions [37].

In this requisition-based supply system, there is a predisposition towards demand-driven choice of drugs. As a consequence, some manner of engaging retailers in restricting access to second-line drugs may need to be incorporated [47].

Additionally, innovative means of promoting the sale and administration of correct and complete dosages should be explored within the retail sector. Suggestions for effectively distributing multi-dose medications in the retail sector include the distribution of prepackaged age-specific dosages with illustrations that clearly depict the age range appropriate for each package [42].

Ensuring equitable access to education and basic health services for malaria control and management must remain a priority [41]. Increased consumer protections and knowledge of consumer rights could be reached by setting standard prices of which consumers could be kept informed by radio and other media.

Findings from Grey Literature

There are very large geographical disparities in child mortality rates across different provinces of Kenya, ranging from 54 to 250 per 1000 live births. While much of the population lives in rural areas, there are increases in pastoralists becoming more settled. Geographically, certain rural areas like Northern Kenya are deemed "hard to reach", while there are other challenges in improving care-seeking in urban slums. Some areas have a higher burden of malaria in addition to other health conditions.
Choices of facility for childhood fever were determined by distance to facility, the sex of the child, number of sibling, mother's age and education level. Commonly cited reasons for not seeking medical care included: care was too expensive, the illness was perceived to be minor or that it could be self-treated. Those who were older prefer to seek care from government facilities or private hospitals. Nearly half of the population choose private care in Kenya. More wealth or assets is associated with better health, as better care and better or more food can be afforded. Demand for public care was associated with provision of ORT, vaccines, and family planning services, while availability of intravenous treatment for diarrhea increased chances for private visits. Opportunities for improvement include improving counseling of caregivers presenting at clinics and increasing visual aids for client education and availability of counseling materials at clinics.

Recommended communication interventions included education of families through social mobilization to encourage desirable behaviors. Challenges in communication for behavioral change included poor articulation of the community-wide strategy, and that communities did not participate in the development or dissemination of messages. Demand creation and provision of quality services was seen as critical, as was education of families to recognize danger signs of serious illness and to know where to seek treatment. One point emphasized in the grey literature was the importance of avoiding demand creation without commensurate services being in place.

Directly related to commodities, specific challenges identified include: insufficient allocations of finances, delays in disbursement of funds to be used for procurement, insufficient human resources for logistics management, poor and unavailable reporting, and delays in deliveries.

Community partners who can be valuable in community-wide efforts to promote behavioral change for child health include community health workers (CHW), mother-to mother support groups, dispensary health committees, other community groups (women's groups, youth groups, church groups, political groups, opinion leaders, political leaders), and the local administration (chiefs, assistant chiefs, village elders). Men are seen as potentially influential role models to encourage behavior change.

Non-biomedical practices that had been noted included giving the child salty water to drink when sick with fever. Harmful practices included giving sheep's urine of local herbs "rai" by some members of the community. Giving children cold water to drink or cold foods was believed to be a cause of malaria, or to avoid eating mangoes. As well, there was a perception that giving a child fruits can lead to severe malaria.

Niger

Niger is a landlocked country of the Sahel with a population of 15.5 million people, spread over 1,266,700 square kilometers of land. Eighty-three percent of the population lives rurally, and less than one-third of adults are literate. The under-five mortality rate is 143/1000- meaning one in every seven children will die before their fifth birthday [13]. Forty-six percent of children under five suffer from moderate or severe stunting. The leading causes of death for children under five years of age are diarrhea (20%), pneumonia (19%) and malaria (18%) (Figure 9). Appropriate response to childhood illness for diarrhea and malaria is reported in roughly one-third of cases, and nearly half of cases of pneumonia (Figure 10).

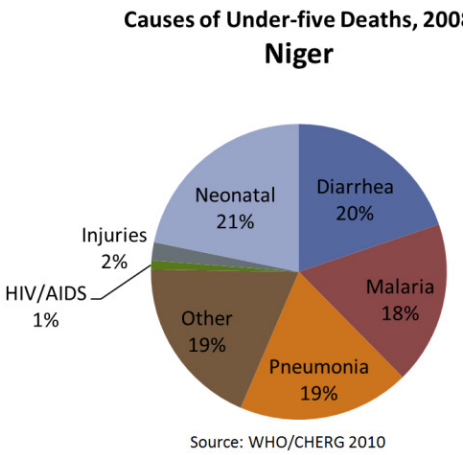

Figure 9. Pie Chart of Causes of Under-five Deaths in Niger

Description of Published and Grey Literature from Niger

In compiling this review, the amount of relevant published literature concerning Niger proved limited; merely one relevant peer-reviewed article was selected for inclusion and assessed. In addition, a host of grey literature was evaluated for relevance, and findings from three pieces of grey literature are incorporated with the published article below. In total, two quantitative and two qualitative works are described. Two are of general relevance to childhood illness, one is specific to pneumonia and one is specific to diarrhea. The locations of studies and grey literature are noted below (Figure 11).

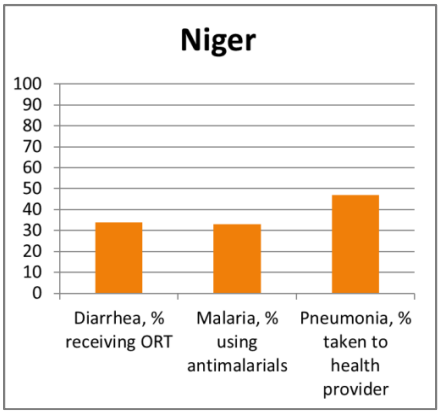

Figure 10. Bar graph representing percent of caregivers responding appropriately to childhood illness in Niger

Barriers to Childhood Illness

All in all, Niger's child mortality rates are on a progressive decrease, even though child mortality rates in this region are among the highest in the world. Children less than 5 years old make up for 60% of all health consultations in Niger and an increase in consultations has been seen over the past. Three explanations for the high child mortality here that are related to care seeking have been suggested: delay in decisiveness in seeking care, delay in obtaining care and delay in benefitting from qualified care. The first barrier to care seeking is related to cultural and educational factors as well as poverty. The second barrier has much to do with availability of care, while the last one has to do with availability of qualified care and cost of care.

A qualitative study in Zinder 2011 aimed to evaluate the knowledge among the population concerning the 2 year-old UNICEF-sponsored program of educating community health workers. Results showed a high level of awareness of the community health workers and no hostile feelings towards them [49]. Educating community health workers was seen as positive because they are part of the local population that they serve. As such, information spread by CHWs is believed to have a good chance to be adopted into practice [49]. Many hygienic and preventive behaviors had increased during the 2 years, in addition to increased utilization of health services. More women than men were aware of the health workers, making men a strategic group to target in future implementations of CHWs [49].

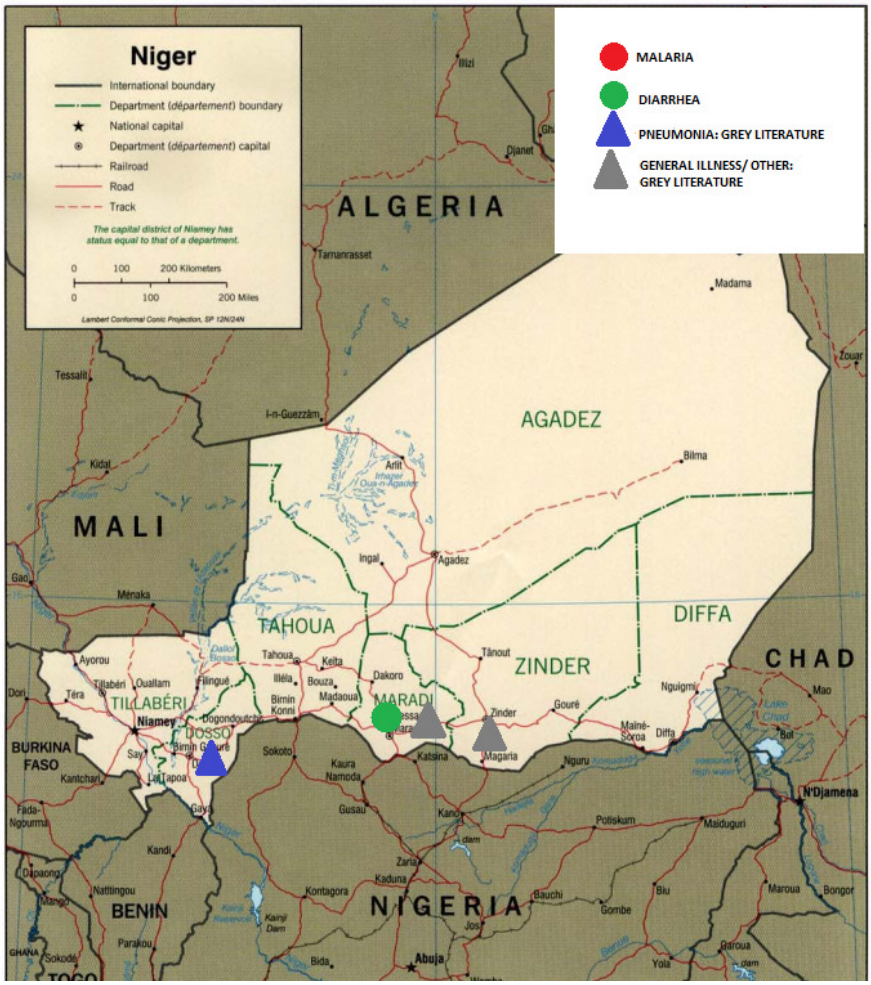

Figure 5. Map of Niger Depicting Included Study and Grey Literature

A qualitative study in Mayahi, in the Maradi Region, aimed at identifying social and cultural barriers to better child health. In general, caretakers neglected to take preventive and health seeking initiatives, and family and community lacked interest in health issues [50]. Another barrier was the amount of work-load, especially for women.

Another study was designed to investigate antibiotic regimen adherence for pneumonia in the Dosso region of Niger [51]. Low compliance to antibiotic regimens can be a key contributing factor to the development of antimicrobial resistance, increasing the threat of infectious disease. A qualitative methodology was used to assess parental knowledge of respiratory infection, medications (specifically antibiotic therapy), traditional remedies, health-seeking behavior, cultural beliefs about wellness and illness, traditional dissemination of information, and the appropriate way to deliver a message to caretakers of children. The assessment showed that parents understood the antibiotic regimen when leaving the health center, but only half could remember the information three days later [51]. Caretakers believed the antibiotics were effective but often discontinued treatment before they had been told. Adherence was improved by through the use of images when conveying the health messages explaining

the importance of the regimen. A possible barrier to appropriate care seeking was that Cotrimoxazole (antibiotic) could be purchased more cheaply at the market [51].

A study in the Maradi region explored care-seeking behavior for prior cases of diarrhea and also explored how a caregiver would respond in a future case of diarrhea. Caregivers also described signs of dehydration, with three-quarters recognizing sunken eyes [52]. Results from retrospective behaviors and actions that would be taken in hypothetical cases were very similar. Formal care-seeking at a health structure was very high. More than half of all respondents sought care at a health center, with an additional one-third seeking care at a health post, and 10 % going to hospital [52]. Households were increasingly likely to seek a consult with each additional under-five child in the household. For those who did not seek care, most cited spontaneous recovery or self-medication obtained from drug vendors. Among those who did seek care, the vast majority (80%) received ORS, with half of all cases perceived as severe receiving intravenous rehydration, and 8% of all cases hospitalized at least one night. Almost all respondents whose child did not have diarrhea during the recall period said they would seek medical attention if their child had diarrhea. Roughly 10% of caregivers cited financial problems as a constraint on care-seeking. Education level of the caregiver was not associated with seeking care at a health structure [52].

The high proportion of caregivers administering ORS indicated appropriate compliance with recommendations for treatment of simple diarrhea. However, only half of cases with severe diarrhea received appropriate care. The source of care did not vary by perceived severity of illness, suggesting another factor determines where caregivers seek care for diarrhea in this population [52].

Summary of programmatic implications

1. Encourage awareness and interest in health issues among caregivers and members of the community.
2. Community Health Workers could be gradually introduced.
3. Efforts to improve economic access to facility-based care are necessary to reduce financial barriers preventing mothers' demand for appropriate treatments
4. Education of caregivers presenting at facilities could convey relevant information to encourage appropriate treatment and prompt care-seeking.

1. Encourage awareness and interest in health issues among caregivers and members of the community.

Enhanced awareness surrounding health issues may encourage family and community interest. Educational interventions within communities on preventive measures, symptom recognition, and provision of appropriate home-care or encouragement of care-seeking may be critical first steps in

improving proper care for childhood illness. Providing education may be one essential component enabling caregivers to feel empowered to take preventive and health seeking initiatives. Education concerning symptom recognition may curb the tendency to delay in seeking care.

2. Community Health Workers could be gradually introduced.

Community health workers could be integrated closely with the community by community voting to select CHWs and other methods to encourage direct engagement of the community or ownership of the community in this program. The introduction of CHWs could be spread gradually across communities and districts as communities are readied. Awareness of CHWs needs to grow alongside this effort, to ensure interest and use of CHWs' services. Men may be a strategic group to target in raising awareness of CHWs during future implementation programs.

3. Efforts to improve economic access to facility-based care are necessary to reduce financial barriers preventing mothers' demand for appropriate treatments

Around one in ten caregivers cited financial difficulties as a barrier to care-seeking. Promotion of revenue-generating activities or stimulating economic earnings might be one manner by which women will be more financially able to access appropriate care. While caregivers must have the financial resources to afford care, transportation and treatments, they also need to be able to afford time away from revenue generating activities and time away from work or chores of the household. As such, social protection mechanisms such as cash transfers or voucher schemes may allow increased access to appropriate care in such an area where financial barriers are cited. Unfortunately, antibiotics were described as more cheaply available at the market, indicating that the availability of highly subsidized drugs at the clinic may encourage appropriate care-seeking to a provider.

4. Education of caregivers presenting at facilities could convey relevant information to encourage appropriate treatment and prompt care-seeking.

Interestingly, the education level of the caregiver was not associated with seeking care at a health structure for children with diarrhea [52]. Health-seeking messages from a different source must be influencing or motivating the choice of facility-based care for mothers. For those who seek care from a facility, opportunities exist for the education of these caregivers who do present with a sick child. One aspect is clinicians' better promotion of adherence to drug regimens. Perhaps the provision of better aids

by which caregivers could absorb such critical messages will allow better learning and retaining of such important information. As illustrated in one study, while caregivers understood drug treatment instructions when leaving the facility, only half remembered it three days later [51]. This opportunity at the facility for conveying health information could extend to reach this target group of parents of young children who do access facility-based care to do so in a prompt manner.

Nigeria

Nigeria is Africa's most populous country, with a population numbering around 160 million on a land area of 910,770 square kilometers. Just about half of Nigeria's population lives in rural areas. Sixty-one percent of adults are literate [13]. The under-five mortality rate is 138/1000, meaning one of every seven children dies before age five, and 43% of children under-five suffer from moderate or severe stunting [53]. The leading cause of child death outside of the neonatal period is malaria (Figure 14). In response to childhood illness, 45% percent of children with suspected pneumonia are reportedly taken to a provider for care. Just over 30 percent of children with fever receive and antimalarial. One-quarter of children with diarrhea receive oral rehydration and continued feeding [13] (Figure 12).

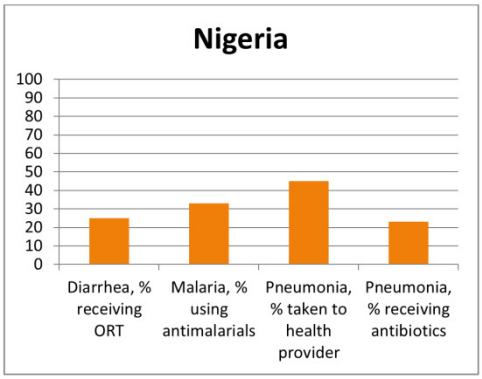

Figure 6. Bar graph representing percent of caregivers responding appropriately to childhood illnesses in Nigeria

Figure 7. Map of Nigeria Depicting included Studies

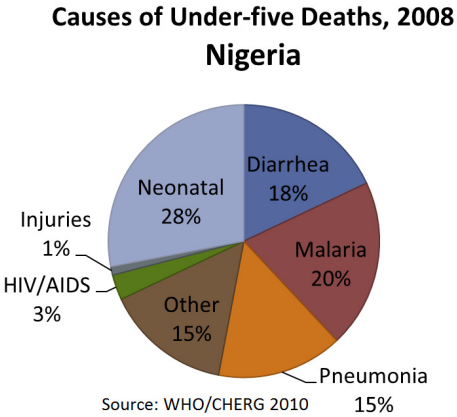

Figure 8. Pie Chart of Causes of Under-five Deaths in Nigeria

Description of Published Studies from Nigeria

Seven of the 15 study populations were from south-western, 5 from south-eastern and 2 from southern Nigeria. One study was from northern Nigeria. Nine studies were targeting households and 6 targeted health centers. Ten studies were from rural areas and five from urban areas. Twelve studies investigated malaria, 2 studies were on childhood illnesses in general, and 1 study was on diarrhea (Figure 13). Additional topics looked at include perceptions related to pain in infants, perception of teething symptoms, and consumer preferences for drug therapies.

The study populations consisted of mothers or caregivers of children under 5 years of age. In addition, one study had focus group discussions (FGDs) with fathers and one study interviewed drug-sellers and drug-consumers. A total of 6054 households participated with 6054 children under the age of 5. Twelve medicine sellers also participated.

The topics bridged by the reports were: knowledge and care-seeking for children with malaria, care-seeking choices in febrile illness, mothers' knowledge of childhood pain, knowledge and use of ORT in diarrhea, and prevalence of abdominal scarification. Twelve of the studies were quantitative, two were qualitative and four employed mixed methodologies. The studies collected data using structured interviews, focus group discussions and in-depth-interviews with informants. Most studies were cross-sectional and one was a pre- and post-intervention study.

Childhood Malaria and Febrile Illness

Perceptions of Malaria

In Nigeria, mothers identified malaria as a most common cause of childhood fevers and as the most reported cause of pain in early childhood [54]. Perhaps because it is believed to be so common, malaria was also labeled as an "ordinary fever" [40, 55]. Even when mothers stated that their children's illnesses were caused by malaria or exposure to mosquito bites, and the symptom was identified as "high temperature", some caregivers still stated that it was manageable or not too severe – an "ordinary illness" - potentially trivializing the condition and resulting in insufficient treatment.

Perceived causes and methods of prevention of malaria showed poor knowledge of causation of malaria among some respondents. While in one study, the role of mosquitoes in the transmission of malaria was recognized by more than 20% of mothers [39], in another study, only 8% [55] of respondents mentioned mosquitoes. "Too much work" was a common explanation given by 18% of respondents in one study [55], as was "too much sun" [39, 55], reported by 13% and 19% of participants across two studies. One-third of participants in two different studies did not know the cause of malaria.

While 99% of respondents in one study said that said that malaria was preventable, most frequently cited methods of prevention included use of unspecified drugs (22%), fervent prayers (11%), eating good food (7%), and regular hospital visits (7%) [55].

Management of Malaria

When seeking care for malaria, a majority (65%) of urban caretakers patronized private/government health facilities, while most (62%) of their rural counterparts resorted to self-treatment with drugs bought from patent medicine vendors. Rural mothers use more of informal than formal health services.

significant relationship was reported between malaria knowledge and first action taken at home to treat. Most children had been given treatment before presenting with the illness. Home management of fever was more common in urban than in rural households.

Initial care for childhood illness in general was most often provided within homes, and indeed, in many cases, care at home was the only form of treatment provided. Home care mainly involved the use of drugs (ranging from 52% to 90%) [56] and tepid sponging of the febrile child (64%), whereas use of herbal preparations was much less frequently reported.

One study at a hospital emergency room found that 72% percent of mothers administered various drugs to their children before presentation [56] and in another study in an urban setting, 89% gave home treatment prior to presenting (of which 90% was paracetamol). One of the lower reported numbers of home administration of drugs prior to presentation at a health facility was 31% [39], whereas at the other extreme, a study looking at febrile children found that 98% had received chloroquine before presentation [57].

The percentage of children treated for fever at a health care facility ranged from 28-65% [39, 55, 58]. Care was mostly sought outside the homes from drug vendors and private clinics. Reasons given by those who preferred to patronize patent medicine sellers were: proximity to the homes, availability of drugs anytime of the day, freedom to purchase whatever quantity of drugs they could afford, and availability of credit when necessary.

The vast majority of children treated at home received drugs bought at patent medicine stores (87%), while few (4%) received drugs bought at dispensaries. Another study reported purchase of drugs at a medicine shop by 44% of caregivers suspecting malaria, with far fewer seeking remedies from a traditional medical practitioner (6%) [39]. A small proportion of caregivers (5.5%) took ill children to the patent medicine store with them when they went to purchase drugs.

In choosing antimalarials, half of caregivers selected drugs for home management of malaria in children based mainly on previous experience [55]. Decisions were also based on advice from clinicians as well as various members of the community: patent medicine sellers, health care workers, relatives, and friends.

Preference of drug formulations by caregivers in home management of malaria was syrup (58%), followed by tablets (36%), and injections (13%). In another study, there was a strong preference for tablet formulation; it was attributed to ease of administration, early onset of action, tablets could be carried around and given at home, market, or farm and were cheap. Injections accounted for 33% of treatments received by the children at facilities [39].

Convulsions, anemia, and measles were said to be serious childhood illnesses that needed special attention by traditional healers [55], as these conditions could be rapidly fatal. Thirteen percent of respondents in one study were of the opinion that traditional therapy was ineffective and sometimes dangerous [55]. Other alternative methods of treatment, like sprinkling of holy water or praying over febrile children was reported at a low percentage [39] , while living in an extended family network influenced the choice to administer home herbs or plain water enema as treatment [59].

Abdominal scarification was found to be an extremely common practice to treat splenomegaly, found on 77% of 390 children surveyed in one community in Edo State. Eighty-two percent of parents in this

survey believed that scarification reduces splenomegaly. While one quarter of parents attributed splenomegaly to malaria, more than one-fifth% explained that splenomegaly is the cause of malaria. Distressingly, the indications for seeking abdominal scarification described by the respondents were common signs and symptoms of simple and complicated malaria, such as fever, weakness and distended abdomen [60].

In one study, care was most often initiated longer than 24 hours following the onset of symptoms. Of mothers who did seek to provide care within 24 hours, a significantly higher proportion provided care within the homes. Urban mothers sought care faster than rural mothers, though the total cost of treatment was higher in urban areas. Rural mothers, however, were more likely than urban mothers to recognize danger signs and symptoms of severe illness. Rural mothers only go to hospital when the problem persists or becomes worse, which results in delay in seeking appropriate and timely care [61].

General Childhood Illness

Fever in childhood was commonly attributed to teething, as were symptoms of other common childhood illnesses. One study counted more than 70% of mothers who reported that teething causes fever, and nearly 60% of respondents who said that loose stools are associated with teething. Teething was believed to be responsible for a wide range of symptoms, from fever to diarrhea, blood in stool and loss of appetite [62]. Even for children who received a malaria diagnosis by physicians, 34% of their mothers still attributed their children's illness to teething [40].

Some mothers were told that the eruption of a tooth triggers a fever largely through interactions with other family members [40]. The belief that teething is responsible for high temperatures prompted high attendance at a health clinic, as some mothers believed that treatment from the clinic would enable children to become better.

One-quarter of parents expressed that not using teething medications could result in severe illness in a child, while half of caregivers believed that nothing will happen to a child even if teething medications are not used [62].

One study asserted that there were no harmful consequences of attributing symptoms of childhood illness to teething, as parents did not deter decisions to seek effective treatment at the clinic [40], whereas another study was concerned that this association of symptoms to teething may result in delayed interventions and subsequent increased morbidity and mortality [62].

There was one study that looked specifically at mothers' perceptions of pain in infants [54]. Mothers were able to describe observed behavioral responses to pain in their infants as crying, irritability, and facial expressions. Among the most common causes of pain identified in infants were malaria (46% of mothers) and gastrointestinal problems (17% of mothers). Yet, only 3.8% of mothers expressed that infants younger than one month of age could experience pain. And, more than 70% of the mothers said that pain could only be felt by an infant who reached age 12 months or greater. These findings support a myth that supposedly has affected attitudes of both caregivers and health professionals in not responding appropriately to pain in neonates. A further complication that was suggested by authors of this study was a belief that pain experience is essential in developing strength and courage and a sign of maleness [54].

Reasons for Delay in Care-seeking

An extremely high percentage of mothers reported that infants younger than 1 month do not experience pain, which may delay care-seeking for children at this very vulnerable age. Parents were more likely to seek care within 24 hours for children with fever than for those with cough or diarrhea. In one study, only 17% mothers took children for treatment in a health facility within 24 hours of onset of fever. In another study, 74% of respondents said that their children received treatment the same day or one day after they noticed their children's fever, while 23% delayed for 2 or more days.

Persistence of symptoms was consistently the main reason given for seeking help at a health center for a child with fever or presumed malaria. Development of additional symptoms like convulsion, loss of appetite, or vomiting were also cited as reasons motivating care-seeking. Those who perceived the illness to be mild or not severe only sought effective treatment because the symptoms persisted or because and they wanted "proper treatment" to make their child feel better [40].

Many cited their reason for waiting to seek any care outside the home was because they did not consider their child's illness to be severe. Reasons cited for not seeking care at orthodox health facilities at the onset of illnesses included non-recognition of the severe nature of the illness and poor finances. In one study, less than 40% of mothers believed their child's malaria was severe.

Drug and Treatment Preferences

Women more often than men mentioned hospital treatment as first preference. A majority of respondents in one study believed treatment in the hospital was best for childhood fevers because it ensured the use of unexpired and effective drugs [55]. Antimalarials prescribed by the physicians were preferred over those bought from pharmacies [40].

An association between medicine color and drug function is common. Color does not appear to be the overriding factor in drug choice, and rather consumers are ultimately looking for is a medicine that ''works.'' But, as the authors articulate: "This is not to say that people will buy any color drug." [63] Consumers believed that yellow drugs were appropriate for malaria because they perceived that the symptoms of yellow eyes and yellow urine are associated with malaria. Blue, on the other hand, was associated with sleep-inducing medicines or depressants, and red tablets as blood builders or stimulants. These specific mental associations between color and ailment dictated white was appropriate for pain tablets. These associations between color and medication may help community members with low literacy skills ensure that they are given an appropriate medicine for their illness.

Herbal treatments were typically not mentioned by more than 10% [55, 57] of respondents, however in one study of general childhood illness, it was cited by 16% [56] as their first-line treatment and over half of participants in focus group discussions used them for malaria and believed them to be more effective than orthodox treatments [55]. More men mentioned herbal treatment as the preferred option for treating malaria than women. Women in the rural area were more likely than urban women to mention herbal therapy as first line treatment. Reasons for preferring herbal remedies were that herbs were easily available, cured fevers completely, and the recipes had been passed down for many generations from their forefathers.

Some caregivers said they often stop drug administration as soon as the sick child was well, saving the rest of the drug for the next child in the family (nuclear or extended) who develops fever[55]. Rural mothers were more likely to use leftover drugs from previous treatment to treat the fevers than urban mothers [61].

Gender and Social Influences in Careseeking

Values expressed in extended family institutions were indicated as influences on both behavior and decision making in mothers. There is increasing involvement of mothers in decision-taking with regard to care-seeking for childhood illnesses, but it is clear that other family members provide advice to mothers regarding illness concepts and advice for care-seeking.

The husband/cohabiting partner (47%) was mainly responsible for child malaria decision taking in the home, followed by mothers themselves (26%), grandmother (8%) and friends and neighbors (3%) [39]. A second study corroborated with similar results: fathers more often than mothers (54% versus 33%) made the decision of where children who were ill received treatment, while grandmothers and other caregivers made the decision 4% of the time [55]. Mothers treat fevers under advice of extended family and community elders instead of seeking medical attention. Mothers (52%) paid for the drugs more often than fathers (45%). Joint decisions made by both parents of the ill child were hardly described. No gender differences were observed in perception of causation among caregivers [55].

Distance and Financial Barriers

The leading reasons cited for not utilizing orthodox health services at the onset of illnesses included poor finances [56]. Socioeconomic factors proved to influence both behavior and decision making in mothers.

Hospitals were geographically more accessibility to urban than rural dwellers [58]. In one study, roughly two-thirds of urban caretakers patronized health facilities. Nearly two-thirds of their rural counterparts resorted to self-treatment with drugs bought over-the-counter from patent medicine vendors [58]. While 67% lived close to orthodox health facilities, only 50% utilized them [56], suggesting that proximity to health facilities is not the only factor influencing utilization, but cost and other socio-cultural issues must also be considered.

Education

In caring for children with diarrhea, reported access to ORT fluids was high, with 73% of children with diarrhea being offered an ORT fluid at home. However, the method of preparation and administration of fluids was unsatisfactory [64]. Previous experience with ORT fluids, higher educational or socioeconomic status did not correlate significantly with better performance [64].

Health education is required to improve timely seeking of appropriate health care for childhood illnesses. Perceived causes and methods of prevention of malaria showed generally poor knowledge of causation of malaria among respondents [39, 40, 55]. Mothers that received a malaria educational intervention responded to treating fevers appropriately.

Summary of programmatic implications

1. Community Health Workers are a potential valuable source of information for caregivers and their education should continually be renewed and improved.
2. Consumer drug color preferences are strongly held and influential. These should be elucidated using market research to capitalize on people's innate beliefs about drug efficacy.
3. The role of mothers as decision-makers is increasing; however fathers are still often the head of households. Educational interventions must target both parents and the larger community.
4. Educational interventions must dispel common myths that are detrimental to child health.
5. Education concerning malaria must emphasize prompt care-seeking and must convey the potentially serious nature of the illness to the caregiver and extended family.
6. Educational needs of caregivers concerning malaria differ from rural to urban setting.
7. Education targeting drug vendors could improve use of appropriate drugs and encourage referral for severe cases or complicated malaria.
8. Recurrent education for caregivers on home management of diarrhea is essential.

General Childhood Illness

1. Community Health Workers are a valuable but too infrequent source of information for caregivers in some settings; their education should continually be renewed and improved and their reach widened.

The community health worker can be a valuable source of information on common childhood disorders like fevers, cough and diarrhea. The skills of these workers in counseling should regularly be appraised and improved through training [65]. The presence of CHWs should be broadened and communities should be active partners in developing such programs to enable a sense of ownership among communities and promote sustainability of the programs.

2. Consumer drug color preferences are strongly held and influential. These should be elucidated using market research to capitalize on people's innate beliefs about drug efficacy.

When new drugs are marketed, consumer perceptions and expectations should be recognized. The colors of drugs will not necessarily inhibit sales, but consumer education and drug seller training is needed so

that people will accept the appropriate medications [63]. Consumers claim that they judge a new medicine on its effects, however strong mass communications campaigns for consumers may be advantageous when rolling out new formulations [63].

3. The role of mothers as decision-makers is increasing; however fathers are still often the head of households. Educational interventions must target male and female caregivers and the larger community.

Mothers are increasingly involved in decision making and care seeking for their sick children, and in recent studies, even made care-seeking decisions more often than the fathers. Mothers were also more likely to pay for treatments, as in many communities, a majority of women are involved in economic activities [55]. However, men still often serve as the head of household and may lead or greatly influence care-seeking decisions. As such, the involvement of the father, and other potentially influential people in the household or community, needs to be taken into consideration in educational interventions, and for successful implementation of home management [39, 55].

4. Educational interventions must dispel common myths that are detrimental to child health.

Mothers know that infants experience pain, but surprisingly, many do not believe that neonates experience pain: only 3.8% of mothers believed that infants less than 1 month old can experience pain [54]. The potentially delayed or absence of care-seeking may put this most vulnerable age-group of children at great risk. Apparently, this is seen as a somewhat common myth, that, over the years, has affected the attitude of adult caregivers and health professionals in not responding appropriately to pain in the youngest children [54].

It is quite common for mothers to commonly ascribe symptoms of childhood illnesses to teething. It is important therefore, that mothers are targeted with health promotion messages that will ensure appropriate and prompt interventions for a symptomatic child of teething age [62]. Managing teething-associated problems varies from locality to locality and focuses on symptom relief, which may lead to danger for the young child who is sick with a serious childhood illness [62].

The continued use of abdominal scarification as treatment for malaria-induced splenomegaly is due to lack of awareness. It is an extremely common practice in some areas and information needs to be conveyed to these rural populations to eliminate this dangerous and ineffective practice [60].

5. Education concerning malaria must emphasize prompt care-seeking and must convey the potentially serious nature of the illness to the caregiver and extended family.

Increasing malaria education to caregivers is one opportunity to improve child health and reduce malaria related mortality. Caregivers are responsive to information on home management of childhood fevers [66]. Caregivers' abilities to recognize when the child is ill is essential for motivating treatment-seeking [39]. Malaria was commonly perceived as "ordinary fever", a notion that it was a trivial disease state. This needs to be done away with so that sufficient and prompt treatment is sought for all cases [55].

Overall, educational interventions are best to highlight treatment-seeking behavior in a positive light rather than risk dismissing values and deep-rooted practices that mothers may have toward malaria treatment strategies [40]. Care-seeking for illnesses characterized by fever is better than for other illnesses, suggesting a need to emphasize recognition of the other potentially serious symptoms of childhood illness [56]. Caregivers expressed that children whose illness progresses to convulsions or severe anemia were preferentially treated by a traditional healer [55].

Mothers were not well-equipped to administer home management of malaria: half did not give an appropriate amount of chloroquine in one study (the most commonly used medication, as ACTs were reportedly not widely available). Following inadequate chloroquine administration, they were likely to delay seeking care at a facility, where the child would then be put at risk of over dosage by health center staff who didn't know chloroquine was administered previously [57]. ACTs are seen to be expensive, of limited availability, and to have no simpler dosage regimen. About one-third of children presented at a facility with complicated malaria, and this is associated with delay in seeking outside care and delay in giving anti-malarials [57]. Home management must be improved with proper education provided to caregivers. Prompt care must be sought, and caregivers must be able to easily access affordable efficient medicines.

Education must not target solely the mother, but, as described above, fathers are more likely to make malaria-treatment decisions. Education would ideally be expanded to include members of the extended family. It was asserted that in a rural area, money was not the constraint that most greatly influenced first action taken in seeking care for a sick child, but rather socio-cultural considerations demanded the mother consult her in-laws in the husband's absence before she could seek outside care [59]. If the child was diagnosed with fever, the neighbors may weigh in with advice as well. This was especially true if the mother's first line of treatment failed to cure the child.

6. Educational needs of caregivers concerning malaria differ from rural to urban setting.

Urban and rural mothers are aware of malaria as a major cause of childhood fevers. But differences exist in their knowledge of symptoms of childhood fevers, ability to recognize danger signs, type of health facility sought and actions taken in response to childhood fever, which may be important considerations when targeting these different populations with national malaria program efforts [58, 67].

7. Education targeting drug vendors could improve use of appropriate drugs and encourage referral for severe cases or complicated malaria.

Educational interventions targeting drug vendors could be a valuable measure to improve management of malaria [58] as a majority of care sought outside the home is from drug vendors [56]. Patent medicine vendors are likely to continue as a major source of antimalarial drugs for most rural communities and may be a valuable manner by which to improve quality of home treatment. Drug vendors are geographically and economically accessible to people in rural communities who may have little other access to sources of health care or medications. Measures to promote appropriate health-seeking for the control of malaria should involve educational activities directed at drug vendors to promote sale of appropriate drugs to care seekers, but potentially also through drug vendors as a way to convey health messages to care seekers, especially to promote the importance of completing the course of treatment [58]. Pre-packaging of antimalarial drugs and ensuring they are offered at affordable prices may encourage their appropriate use by caregivers [57].

8. Drugs must remain affordable.

Financial constraints were a major determinant of care-seeking behavior, for not only the modality of treatment sought but also the source. Even for home management, caregivers purchased drugs from hawkers or patent medicine stores rather than formal dispensaries because they were cheaper [55]. Even though caregivers suspected that drugs were fake or of compromised quality from these sources, cost was a main determinant.

Diarrhea

9. Recurrent education for caregivers on home management of diarrhea is essential.

Knowledge and skills of how to prepare and administer ORT need to be widely promoted on a continuing basis. Health workers need to be involved to ensure that caregivers are taught properly and adhere to the correct recommendations regarding oral rehydration therapy [64]. Previous experience with ORT fluids, higher educational or socioeconomic status did not correlate with better performance on administering

ORT, and emphasize the importance for sustained and continuing education on the topic for all members of the community and on a repeated regular basis [64].

Findings from Grey Literature

Despite the presence of national policies to aid in enabling child survival in Nigeria, coverage for simple life-saving interventions remains inadequate. There are disparities in childhood morbidity and mortality by class, gender, and geographically across Nigeria. A National Child Health Policy was implemented to promote survival and healthy development of newborn through school-age children. The policy also frames the plan for child health financing and supports the National Health Insurance Scheme and community-based health insurance scheme to help remove financial barriers to care.

Data from the Nigeria Demographic and Health Survey (DHS) indicated that care was sought from a health provider in 45 % of children with symptoms of ARI. Fewer than one quarter of symptomatic children received antibiotics for ARI.

When children had diarrhea, the Nigeria DHS indicates that care was sought from a provider in 42% of cases. Children received some form of ORT of increased fluids in 37% of cases: one-quarter receive ORS from a sachet, 8% receiving recommended home fluids, and 9% of increased fluids. One-third of children with diarrhea were given antibiotics, one-quarter given home remedies or other treatments, and 29% of children were not given any treatment. Only 9% of children with diarrhea were given more fluids to drink than usual. One-third of children with diarrhea were given less to drink, and 22% were given much less to drink.

Among children with fever, more than half were brought to a facility. One-third of all children with fever received antimalarials, while 18% were given antibiotics. Of those children who were given an antimalarial, nearly one-third of households had the drug available at home when the child became feverish.

As treatment at home is often the first line of care for case management of malaria, use of ACTs at home has been adopted as a core component of the Home Management of Malaria (HMM) strategy. The price of ACTs in the private sector was quite high in years prior. But ACTs need to be accessible to households to ensure success of the HMM program. One key aspect of this is the involvement of the private sector and public-private partnership to enable this. Another approach may be incentives for the private sector, such as a price margin on the drugs for patent medicine vendors. This may motivate their commitment to market and sustain the supply chain. Cooperation and collaboration between healthcare workers, mothers and patent medicine vendors is essential for home management of malaria.

At the community and household level, it will be important that behavioral change communication strategies encourage demand for services and inform caregivers of signs of severe childhood illness. CHWs and community-resource persons benefit from clearly defined roles and responsibilities. Refresher trainings are seen as key to ensure that those needing immediate care are referred promptly. Involvement of the community can best be achieved by working with women's group and religious organizations and other community mobilization structures.

Uganda

Uganda has a population of 33 million who inhabit roughly 200,000 square kilometers. Eighty-seven percent of the population lives in rural areas. Nearly three-quarters of adults are literate. The under-five mortality rate is 135/1000- meaning nearly one in ten children will die before reaching age five [13]. Thirty-eight percent of children in Uganda suffer from moderate or severe stunting.

The leading cause of under-five child death in Uganda is malaria (23%) followed by diarrhea (16%) and pneumonia (12%) (Figure 15). Reportedly, 73% of children with suspected pneumonia are taken to a provider for care. Over sixty percent of children with fever receive and antimalarial. Roughly 40% of children with diarrhea receive oral rehydration and continued feeding [13] (Figure 16).

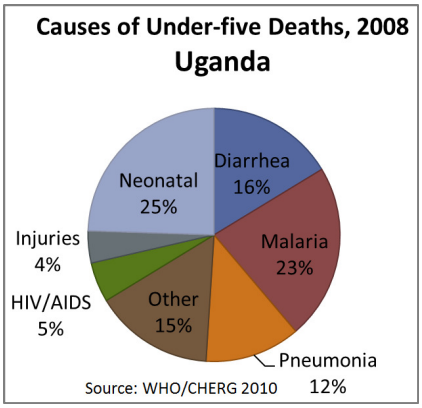

Figure 15. Pie Chart of Causes of Under-five Deaths in Uganda

Description of Published Studies from Uganda

Seven studies were from southern, 4 from western, 4 from eastern, 2 from central and 1 from northern Uganda. Location was not specified in 1 study. Nine studies were targeting households and 6 targeted health centers. Eight studies were from rural areas, 7 from urban areas and 1 from camps for internally displaced people. The study population consisted of mothers or caregivers

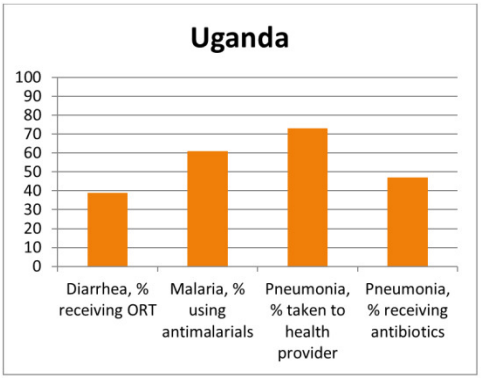

Figure 16. Bar graph representing percent of caregivers responding appropriately to childhood illness in Uganda

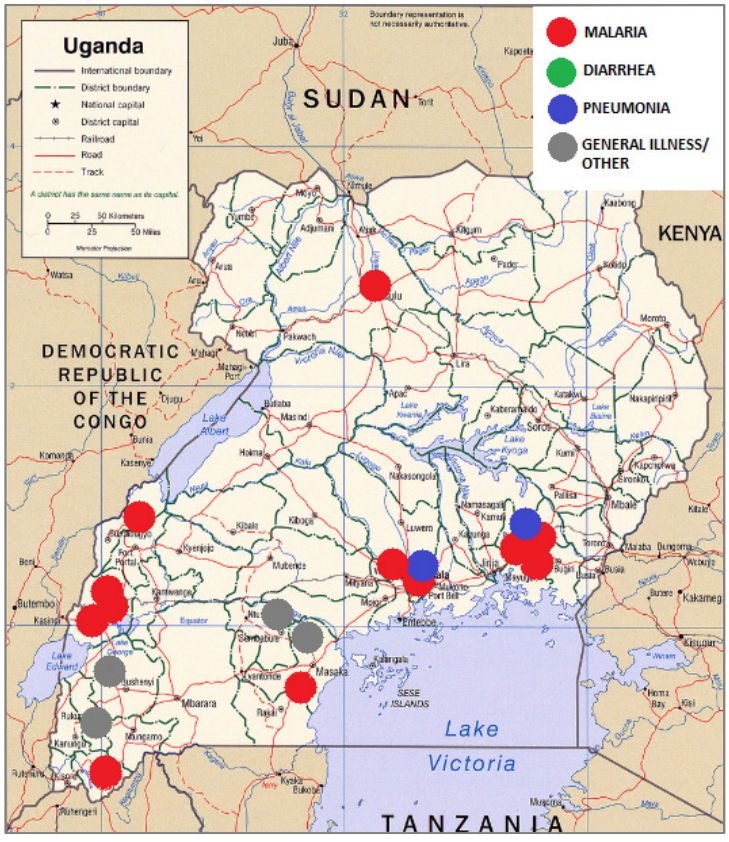

Figure 9. Map of Uganda Depicting Included Studies

of children under 5 years of age. One study included fathers, one study interviewed drug-sellers and 1 study gathered data from health-workers and traditional healers. A total of 17866 households participated with 17892 children under the age of 5. Eleven medicine sellers and 16 health-workers or traditional healers also participated.

Fifteen studies investigated malaria or febrile illness, 3 studies looked at pneumonia or ARI, 2 studies diarrhea, and two were on childhood illness concepts perceived to be associated

with teeth. An additional two studies covered multiple illnesses (Figure 17). The papers reported on topics including knowledge, adherence and care-seeking in caregivers of children with malaria, reasons for treatment failure and delay in treating febrile illness, and prevalence and risk factors for diarrhea.

Fifteen studies were quantitative, five were qualitative and two employed mixed methodologies. The studies used structured interviews, focus group discussions and in-depth-interviews with key informants to collect data. Most studies were cross-sectional. One study was a case-control and one study was a case-series study.

Childhood Pneumonia

Perceptions of Pneumonia

Cough was the most commonly reported first symptom of pneumonia [68]. Fever had reportedly been noted by the vast majority of caretakers a median of 3 days prior to presentation. More than half of caregivers also reported recognition of rapid breathing during the course of the illness. In young children, 19% with pneumonia report overlapping symptoms of fever, cough and difficult or rapid breathing [69].

Management of Pneumonia

There were different preferred actions for difficult or fast breathing across mothers. Treatment usually involved drugs at home. Health workers said mothers use antimalarial and sometimes antibiotics to treat breathing problems. Home care practices for pneumonia included tepid sponging, administration of more fluids or food or treatment with herbs or drugs. Home care was reportedly given to 64% of children before seeking hospital care [68]. Half of these children who received home care were reportedly treated with antibacterial drugs, and one-third had been given an antimalarial, often chloroquine.

Half of all children diagnosed with severe pneumonia at hospital had reportedly been taken to a health-care provider before presenting at hospital, but less than half of them were reported to have received antibiotics. Altogether, 23% of all children presenting to the hospital with pneumonia were said to have received antibiotics only during the most recent episode of illness before seeking hospital care, 13% had received antimalarials only, and 25% reportedly received both antibiotics and antimalarials. Of children with overlapping symptoms of fever, cough and difficult or rapid breathing, 45% were given antimalarials alone [68].

Nearly half of caretakers who reported difficult and rapid breathing gave antibiotics at home or sought care within 1 day after recognition of these symptoms. This was a median of 7 days after noticing the very first symptom of illness appear in the child [68].

Childhood Malaria and Febrile Illness

Perceptions of Malaria

The majority of women (83%) perceived fever caused by mosquitoes as the most serious health problem to children. Fewer women (38%) perceived an upper respiratory tract infection as serious, 33% perceived diarrhea, 31% measles, and 9% thought skin diseases were among the most serious health problems to their children [70].

Over 2/3 knew how malaria was transmitted and how it presented. Unfortunately only 38% of the families knew the correct regimen of chloroquine, 4% for sulpha-doxine pyrimethamine and 0.5% for quinine[71]. The caretakers relied on fever, vomiting and refusal to feed as the main symptoms for their diagnosis of malaria.

Mosquitoes or malaria were recognized as causes of fever by 90% of caregivers. Caregivers had a good understanding of how to recognize fever, with 89% reporting their child feeling hot. Caregivers were less sure how to recognize malaria; only 38% reporting their child feeling hot or having a fever [72]. The recognition of severe malaria was similar to non-severe malaria with the exception that 20% recognized convulsions as a sign of severe disease [72]. Two studies in Uganda reported high (90%) caretaker knowledge of mosquitos or malaria as a cause of fever [72, 73]. Even as such, not all used protective measures against mosquito bites. Other perceived causes included un-boiled water and respiratory illnesses. Commonly mentioned febrile illness classifications included 'Fever of Mosquito', 'Chest Problem', 'the Disease', 'Stomach Wounds' and 'Jerks', any or all of which could be biomedical malaria [74].

Management of Malaria

Most caretakers (66%) administered some form of medicine to the children at home before visiting hospital with suspected malaria. Of those who sought care outside the home, two-thirds had first gone to drug shops/private clinics and one-third first went to government facilities. Predictors of having gone to government facilities included perceiving that the health providers were qualified or experienced. Those who took the febrile child to drug shops/private clinics did so because they were going there to get first aid [75].

In a second study, of those caretakers who had sought care outside the home, (54%) had gone to health facilities; (43%) to drug shops; (1%) to CMDs. In an area with relatively good access to public health services, no official user-fees, and free drugs available from CMDs, 43% of febrile children taken outside their homes for care were still taken to the private drug shops [76].

Government facilities were preferred for conducting diagnostic investigations and attending to serious illnesses, but often lacked drugs and did not treat people fast. Only 31% of the families sought treatment from government health facilities. Drug shops were preferred for having a variety of drugs, attending to clients promptly and offering treatment on credit. However, drug shops were considered disadvantageous since they lacked diagnostic capability and had unqualified providers. Whereas government facilities are preferred for being able to conduct diagnostic investigations and handling serious illnesses, they are often short of drugs [77].

Half of the families sought treatment from drug shops or vendors. Interviews with caregivers and other opinion leaders in the community indicated a lack of confidence in public health facility-based services and more enthusiasm for treating fever at community level. Caregivers reported that if their child had fever, 63% would go to a clinic or hospital as their first action and 97% as their first or second action [71].

Among those reporting self-treatment as their first action, the majority said they would administer acetaminophen (69%) or chloroquine (65%) [72]. In that study, only 29% knew the correct dose for chloroquine, the recommended first-line treatment for malaria at the time [72]. In another study, 38% knew the correct dose for chloroquine, a mere 4% for sulpha-doxine pyrimethamine and 0.5% for quinine [71].

Drugs that have been phased out as first-line treatment for malaria, such as chloroquine and SP, were still perceived as efficacious, [72] yet drug failure rates were reported at 25% [78]. Use of drugs depended on perception of the disease, cost and drug availability and perceived efficacy of drugs. There were divergent beliefs about drug combinations, side effects, packaging, or using drugs over time. Bitter taste and high cost, however, signified high efficacy for antimalarials [77].

The vast majority of mothers preferred pre-packs of antimalarials. The most commonly mentioned reason for this was safety and cleanliness, while ease of application, appropriate dosing and compliance were secondary reasons for their preference. A small percent of women in one study explicitly mentioned the existence of an expiry date as a major strength of the pre-pack. Among women who preferred the conventional (old) form of malaria treatment, the most common reason was familiarity with it and skepticism about using something new, and secondarily, they cited the higher cost for the pre-packed form. Most women said they would rather stock the treatment at home than buy it when a child gets sick [79].

Some caregivers perceived HOMAPAK as a "light drug" of lower quality, not appropriate for treating severe malaria and not matching with some children's blood. However, HOMAPAK was recognized as the most accessible, free and prompt treatment for hot body, and it was credit for reducing the prevalence of severe malaria among under-fives [80].

Those likely to delay care-seeking for childhood fever came from the lowest socio-economic quintile or had presented with pallor. Children less likely to delay had sought care from drug shops or community medicine distributors, had presented with fast breathing, used tepid sponging at home, or perceived the distance to the provider to be short [76].

Childhood Diarrhea

Management of Diarrhea

Seventy-three percent of women did not breastfeed when their child had diarrhea. Less than 25% if children were given more fluid than usual. The majority (58%) of mothers did not know how to mix ORS [81]. For diarrhea, of those who sought care outside the home, roughly half brought their child to a health unit for care [81].

One and a half years after initiative to increase awareness of reasons behind, and alternatives to, traditional tooth gauging, there was an increase in community awareness behind fever, malaise, diarrhea and vomiting and greater acceptance of hospital services [82]. Though there was still widely accepted

concepts of tooth-related illnesses. The illnesses known locally as false teeth or millet disease were said to be caused by prolonged diarrhea or fever or difficulty breathing [83].

Summary of programmatic implications

1. Community education for improving care-seeking needs to focus on responding promptly to symptoms.
2. Detrimental practices like teeth-pulling need to be eliminated.
3. Caregivers need to be educated to recognize signs of pneumonia and respond by promptly seeking appropriate care.
4. Drug distributors could be trained to identify and treat rapid breathing as presumed pneumonia.
5. Home based management of fever guidelines need to be improved, and adherence to them improved.
6. Interventions should target drug shops to increase provision of efficacious drugs. Drugs should be available at subsidized prices.
7. Community medicine distributors could be trained to use available diagnostics

General Childhood Illness

1. Community education for improving care-seeking needs to focus on responding promptly to symptoms. It should also incorporate the role of cultural factors and also the role of fathers in child care.

There is a need for design and delivery of well-focused health-education messages to improve treatment-seeking behavior for childhood diseases [81]. Even when perceptions of childhood illness were high, the care-seeking behaviors were poor, pointing to a need for further interventions to motivate appropriate response to childhood illness. Health education would best target fathers and other members of the extended families with information on appropriate child care practices and would take into consideration cultural factors that influence treatment seeking [70]. Caregivers have perceptions about efficacy of treatments for febrile illness and these need to be addressed through interventions to avoid the diversion of caregivers from taking appropriate actions [77].

2. Detrimental practices like teeth-pulling and the false attribution of childhood illness to teething need to be corrected.

The community needs to be educated and thus empowered to choose practices for child health that are effective rather than continuing to use practices like tooth-gauging [82] . Educational tools might incorporate local perceptions and beliefs, and garner the support of key members of the community to be best accepted and change beliefs concerning ebino and eradicate its practice. Education may need to be continued over the coming years to sustain the discouragement of this practice [82].

Many childhood illnesses are attributed to teething. By encouraging treatment of these conditions at the clinic, and with successfully treatment using modern medicine, perceptions might be changed as to the most effective care for these conditions [83].

However, drug treatment failures were seen to encourage caregivers that modern drug therapies were inefficient and likely to lead them to seek out traditional methods. Sustaining changed beliefs is key, as is ensuring that effective treatments are available.

Pneumonia

3. Caregivers need to be educated to recognize signs of pneumonia and respond by promptly seeking appropriate care.

While caregivers do often recognize key symptoms of pneumonia, many do not respond with any immediate care [68]. As the progression from first symptoms of pneumonia to severe disease can be rapid, prompt initiation of treatment with antibiotics needs to be encouraged. Appropriate management of childhood fever must convey that pneumonia and malaria are distinct illnesses requiring different treatments, and that treatment with antibiotics is imperative in cases of pneumonia [84].

4. Drug distributors could be trained to identify and treat rapid breathing as presumed pneumonia. Otherwise, increases in home-based management of malaria may result in increased mismanagement of pneumonia.

The potential for community drug distributors to be trained to identify rapid breathing should be explored [69]. A presumptive diagnosis and appropriate provision of antibiotics in the community by drug distributors may increase prompt and effective care-giving for children with pneumonia. Many children with rapid breathing and fever are treated with antimalarials alone, and scaling up of home treatment for

malaria without correcting this mismanagement could result in an increase in poor care seeking or inappropriate treatment for pneumonia cases [69].

Malaria and Febrile Illness

5. Home based management of fever guidelines need to be improved, and also adhered to. Care-seekers should be urged to take febrile children to providers even after providing home treatment.

While there appears to be reasonable knowledge about malaria in the communities, there is limited knowledge concerning correct treatment. As government health units appear to play a minor role in the treatment of malaria, there is a wide opportunity for improving malaria treatment with the increasing promotion of home-based management. Critically, improvements must reduce delaying treatment for fevers and encourage adherence to both dosage and duration of the treatment regimen.

Treatment failure in HMM was perceived by caregivers at 25%, suggesting that the regimen followed may have suboptimal therapeutic efficacy [78]. Adherence to guidelines may need to be encouraged or the guidelines themselves revised. An educational strategy is needed to improve caregiver adherence and to encourage caregivers to take children to providers even after giving home treatment to ensure successful recovery from illness [76].

Additionally, HMM does not address the local understanding of 'fever' and while a number of local illness concepts of common childhood illnesses overlap with biomedical symptoms of malaria, mothers are not likely to give western treatments for all of them [85]. Strategies need to adapt information and training material accordingly.

6. Interventions should target drug shops to increase provision of efficacious drugs which should be available at subsidized prices.

Drug shops and community medicine distributors may complement efforts to improve prompt treatment for sick children [76]. Drug shops are associated with prompt treatment provision, but do not necessarily adhere to providing drugs according to treatment guidelines [77]. Efficacious drugs could be subsidized and be made more widely available in the private sector. Prepackaged drugs are well-received. To increase their coverage and uptake for use in home management of fever, provider training and behavioral change communication is necessary, and pre-packs need to be made available in the private sector [79].

7. Community medicine distributors could be trained to use available diagnostics. They need to be supported with incentives and serve in an active role to ensure success and sustainability of community case management.

Community medicine distributors could be trained to do diagnostic investigations. The implementation of community case management of fever via community medicine distributors could increase the proportion of children who receive prompt and appropriate care [75]. Drug distributors (DDs) need to be supervised and recognized by the local government to feel supported in their role. Incentives for DDs and recognition of their role in enabling home-based management of fever might encourage better retention and allow for a more sustainable program [80, 86]. To increase uptake and use of their drugs, there may need to be a strong community educational campaign to correct common misperceptions about drug efficacy [80]. Interventions should also equip community medicine distributors with a reliable supply of drugs and ideally appropriate diagnostics capabilities as well.

Findings from Grey Literature

Results from the Uganda DHS indicate high rates of care-seeking for common childhood illnesses. Nearly three-quarters of children under five with symptoms of ARI were taken to a health facility or provider. Children of uneducated women were least likely to be taken to a health facility or provider when they have ARI than other children. Children in rural areas showing signs of cough and rapid breathing were a little more likely to be brought to a health facility (74%) than those in urban areas (68%). Though nearly three quarters of children with symptoms of ARI were brought to a facility, only about half of all children with cough and rapid breathing received antibiotics. Appropriate care with antibiotics increased with the education level of the mother. Though more rural children visited a facility when sick, antibiotics use for ARI was higher in urban than rural settings.

Similar to ARI, three-fourths of children with fever were taken to a health facility or health provider. The majority of children with fever received anti-malarial drugs. Thirty-five percent of febrile children received antibiotics. Use of antibiotics for fever increased with mother's level of education, and was more common in urban (46%) than rural areas (34%).

For children with diarrhea, care from a health provider was sought for 70% of cases. Children of the poorest and least educated mothers were more likely to be brought for care than other children. Regional differences in care-seeking for diarrhea were striking. In the north, 90% of children with diarrhea were taken to a provider, whereas in the Southwest, about half of children were taken for care. Just over half of all children in Uganda with diarrhea received oral rehydration therapy (ORT) or increased fluids. Seventeen percent received no treatment for diarrhea.

Overall, while the DHS found that the majority of children in Uganda are brought outside the home for care, far too few children receive appropriate care for common childhood illnesses.

Poor quality conditions of health centers in Uganda may be one area to be improved to encourage care-seeking. One organization in Kampala, the Advocates Coalition for Development and Environment, point to dilapidated conditions of health posts in their reports, and the problem of insufficient stocks of drug therapies. While other reviews of the physical conditions of health facilities were not explicitly discussed in the literature compiled, it was pointed out that clean water was not always available, and that pit latrines and facilities to house staff were sometime non-existent or in appalling conditions. Long queues at the facilities were mentioned as a possible deterrent for treatment seekers, and insufficient and unpredictable stocks of drug supplies were revealed as issue, though in Uganda it was pointed out that the situation may have more recently improved.

Programs promoting and training CHWs are one approach to increase accessibility of health care within communities. One program of community-based volunteers in southwest Uganda is known as Community Owned Resource Persons (CORPs). The developers of this program describe some key factors for success a CHW program, and first and foremost, engaging the community is seen as a critical aspect, as is support from local leaders. In this approach, the community was charged with identifying local priorities and strengths and electing the CORPS (CHWs) through a transparent process. The CORPs were trained using the Integrated Management of Childhood Illness (IMCI) curriculum, and were provided with regular incentives such as refresher trainings and recognition programs. The CHW volunteers from surrounding villages would train together and meet monthly. Exchanges for the CHWs to visit other communities were encouraged, as was competitions and community development initiatives. Supervision was provided by health center staff, who are also involved in training and who attend monthly meetings. Services provided by the CORPs include child health promotion activities, home visits and educational presentations, basic assessment, treatment and referral, plus support of children with special needs. In addition, CORPs develop income generating activities for the community, emergency transport plans and health insurance schemes. Such community-based approaches to training and maintaining CHWs may help ensure that needed child health services are available within villages.

Social Protection Mechanisms

Social policies serve to ensure or promote broad and fundamental aspects of well-being essential for social and economic development. The provision of such services or development of these policies must particularly target those who are the poorest or most vulnerable to ensure their potential to benefit. Social protection mechanisms can reduce the social and economic risks that lead to poverty, and can alleviate the stresses that result, and can entrench this vulnerable population in a cycle of chronic poverty.

Ensuring access to health is critical; aspects of the social protection framework serve to improve both access to health services and response to illness by alleviating the economic, educational and social barriers among vulnerable and impoverished populations. Social protection can impact health and results of ill-health by: preventing the poverty-inducing effects of ill health and health costs; protecting vulnerable populations through relief from ill health; and promoting real incomes, increased capabilities and smoothed spending patterns on health. And, cyclically, improved health can result in increased productivity.

Strong linkages have been found between the main determinants of child mortality and social protection interventions [87]. In particular, cash transfers can contribute to reduce incidence of preventable diseases, increase access to health care and food. In addition, social protection interventions, such as social transfers, and programs to increase access to key services (health, education, water and sanitation) can directly and indirectly contribute to improvements in children's health by reducing exposure to risk factors for illness or by enabling care-seeking and provision of treatment. Examples of potential interventions addressing health vulnerabilities are described within the framework developed by UNICEF in table 4 below.

Causes/determinants of health-related vulnerabilities	Social protection interventions: Child mortality/ill health and nutrition
Poverty and inequity-financial barriers to access health services	Social transfers – cash transfer, removal of user fees, health insurance- can contribute to remove financial barriers to access health care services; can help families address food insecurity; improve dietary diversity; increase expenditure on high quality foods; maternity benefits to ensure economic wellbeing of mothers and proper nutrition
Distance and location of services	Cash transfers can help cover costs of transportation as well as time and energy costs associated with health visits
Education and information	Training and information sessions linked with social transfers can increase the access of information on causes of illness/ preventable measures as well as effective nutrition and hygiene practices; Community-based services to complement other interventions, providing counseling and support to vulnerable sectors.
Gender and social norms	Differentiated treatment in terms of feeding practices and care between girls and boys based on traditional and social norms that guide gender dynamics in certain contexts Policy reform as well as changes in key legislation can contribute to ensure equal access to services for men and women; cash payments given to women can enhance their decision-making role, as well as increase investments in children's health and nutrition

Table 4. Examples of Social Protection Interventions and Health Vulnerabilities

Implementing or increasing social protection mechanisms is essential, to enable relief for the most vulnerable, and to protect the potentially vulnerable as increased demand and utilization of health services may increase out-of-pocket spending [88]. High out-of-pocket payments is a widely –cited reason for delays in care-seeking and avoidance of seeking care from appropriate providers. High costs for treatments are also a common reason for caregivers to purchase drugs at market or drugs of questionable quality from informal vendors instead of purchasing from a drug shop or hospital pharmacy.

Insurance plans could be one possible solution to these financial barriers, if sufficient subsidy of premiums is available to the poor. If purchase of insurance may be slowly adopted, other interventions may need to be in place to ensure sufficient reductions for child mortality in the meantime. User fee waivers are another option; however, they may need to be combined with a voucher scheme or cash transfer approach to overcome costs of transportation or opportunity costs that may still remain a barrier.

In remote rural areas, where care is commonly sought from private providers due to lack of access to public facilities, voucher schemes and subsidies for care the private sector may make this type of care more affordable for most rural populations [21].

Innovative financing structures, insurance plans, subsidies, conditional cash transfers and voucher schemes are all potential ideas to explore. Sufficient social protection mechanisms will be essential to protect the poorest and most vulnerable as barriers to care-seeking are removed and demand for care increases.

SUMMARY OF FINDINGS

Summary of Barriers to Care-seeking

Previous work undertaken by UNICEF named the "Demand-Side Barriers Framework" guided the categorization of relevant demand-side barriers presented in the literature (Table 5). Barriers were extracted from the data integration table and categorized according to the four categories of this framework. Both barriers or impediments to care and selected surprising facts or contradicting evidence was also extracted into the following table to illustrate the true variety of findings across the different settings of the studies.

Barriers to Care-seeking	
Financial barriers	**Distance and location of health facilities**
Financial barriers include cost of care, cost of treatment, cost of transportation Many families cannot afford private care; Low SES families seek care from CHWs or use home treatment; Highest SES children are more likely to receive fever treatment compared to lowest SES children; HOWEVER: ACT treatment is not always associated with SES; ORT administration is not always associated with SES	Private facilities were preferred for their close proximity; Government health facilities were at a distance; Greater distance means greater likeliness to delay; Private and NGO clinics may be closer to residents of urban slums; HOWEVER: In settings where a majority live near health facilities, far fewer than half seek care there, preferring drug shops and vendors
Education and information	**Socio-cultural barriers and gender dynamics**
Demand for service relates to having primary education; Level of education associated with treatment practices; Education level influences initiating treatment early; Reasons for delay often not recognizing severe illness; There are many rumors about illness etiology; Beliefs concerning etiology affect care-seeking; Rumors affect drug choice and compliance; Common biomedical terms may have local meaning; HOWEVER: Some studies found no association between education level of caregiver and likeliness to visit health facility; Educational status of mothers not associated with delay in caring for malaria or in providing ORT for diarrhea	Caregivers seek the opinion of spouses, in-laws, elderly relatives and sometimes friends; Decisions may be taken by a spouse or other member of the household; Perception of causation and prevention did not differ by gender of caregiver; Treatment preferences may differ by gender; HOWEVER: In one setting, two-thirds of women would not ask their spouses before choosing to buy a new treatment; Even where majority fathers decided on treatment, mothers still pay for the treatment

Table 5. Examples of barriers to care-seeking extracted from the literature.

Financial barriers:

The choice not to seek care for a sick child was often attributed to a family's inability to afford care. As well, costs of transportation to get to a health provider, opportunity costs of missing household work or income-generating work, and the costs of purchasing the treatments were all barriers to providing effective and appropriate care for children. Truly, as the cost of transportation increases, the likeliness to delay care increases. Demand for care is positively related to having the financial resources for health care.

While household income was significantly associated with care-seeking, this only holds true up to a certain SES level; above this threshold, the effect stabilizes. It was found that SES affects care-seeking decisions, especially concerning source of care. Lowest SES families often seek care from CHWs in their community or provide home treatment for a sick child.

In many settings, children in wealthiest households were more likely to receive fever treatment compared to children from the poorest households. However, in some settings, this did not hold true. Treatment for malaria with ACTs, for example, was not associated with household socioeconomic status in one setting. In a different context, for treatment of children with diarrhea, knowledge and administration of ORT was not associated with SES.

Distance and location of health facilities:

Private facilities were preferred for their close proximity, while government facilities were at a distance. Likeliness to delay in seeking care for childhood illness increases with distance from the home to the facility. In some cases, delay was more likely if the home was more than 6km from a facility, and in other settings, living more than one kilometer from a facility meant the sick child was more likely to be late for treatment than if living closer than one kilometer from a provider.

Urban dwellers typically lived closer to a hospital than those living in a rural setting. Yet for those living in urban slums, the closest and most commonly sought sources of care are private clinics and NGO clinics, rather than government hospitals. Even though urban dwellers may live closer to hospitals than rural dwellers, one study found that families in urban slums more often used herbs and informal health providers than rural families.

The proximity of a home to a facility is not the only determinant of care-seeking. In some settings where a majority of households lived near to health facilities, a smaller percentage of the population actually sought care from these facilities. A most dramatic example was a study in rural Uganda, where nearly the entire population surveyed lived within easy reach of a public health facility, yet only one-third of families with a sick child sought treatment there. Half of families in this area instead purchased treatment from drug shops or vendors.

Education and information:

In some studies, demand for the services was positively related to the caregiver having primary education. There was an association between level of education of the caregiver and the caregiver's treatment practices and educated caregivers were more likely to initiate treatment early. Other studies found that

there was no association between the level of education of the caregiver and their likeliness to bring their sick child to a health facility. Examples of this lack of association were found in studies related to malaria and diarrhea. As well, higher education level did not correlate with better preparation of or likeliness to administer ORT for a child with diarrhea.

Most commonly cited reasons for delay in care-seeking were a lack of knowledge concerning severity of symptoms or that the child's illness was perceived to be mild. It was reiterated throughout the literature that caregivers did not recognize serious illness or did not realize that symptoms went from mild to severe.

Concerning knowledge of illness etiologies or local illness concepts, rumors and misconceptions were sometimes similar across locations, while other concepts were geographically specific. Different beliefs and concepts affected the treatment sought, and in some cases, local illness concepts were linked to detrimental practices. Misperceptions also affect drug treatment compliance, like the belief that drugs are too strong for a child or that a child would have too many drugs in their system. There were also misunderstandings or local understandings applied to common biomedical terms like malaria or pneumonia. Misconceptions also affected caregivers' perceptions of what constitutes appropriate clinical care, coloring their perception of the quality of care they receive when presenting to a clinic.

Socio-cultural barriers and gender dynamics:

Caregivers seek the opinion of spouses, in-laws, elderly relatives and sometimes friends when determining care for a sick child. Care-seeking decisions were often be taken by a spouse or other member of the household. However, one study found a majority of women said they would not ask their spouses before choosing to purchase a specific treatment for their child. Interestingly, even in an example where the majority of fathers decided on treatment for the child, mothers still paid for it.

Across male and female caregivers, there were often no differences noted in perception of causation or prevention of common childhood illnesses. Though, sometimes men and women differed in their preferred mode of treatment. Another fact that was highlighted in the literature was the importance of age, gender and relationship to household head in intra-household relations and treatment decision-making. Values expressed by the extended family influence both behavior and decision making for mothers.

Overall Programmatic Recommendations

Interventions Targeting Caregivers:

- Caregivers must be educated to recognize signs of severe illness. Community education for improving care-seeking needs to focus on responding promptly to symptoms. Community-based efforts must encourage better treatment seeking to CHWs.
- Educational interventions must dispel common myths that delay or prevent appropriate care. Practices that are detrimental to child health must be discouraged.

- Home based management of fever guidelines need to ensure appropriate response to symptoms of malaria and pneumonia, and adherence to guidelines must be improved. Continued and interactive educational interventions in the community are needed to maintain appropriate home treatment.
- The role of mothers as decision-makers is increasing; fathers are still often the head of households and members of extended families may advise during the care-seeking process. Messages must convey the potentially serious nature of childhood illness to both parents and the larger community.
- Caregiver education must consider common local terms for illnesses alongside biomedical concepts of disease and suggest appropriate response to symptoms.
- Valuable opportunities exist for educating caregivers who are seeking help at facilities, where trained health workers can distribute educational messages and materials.

Interventions Targeting Drug Sellers and CHWs:

- Community Health Workers are a common source of information for caregivers and their education should continually be renewed and improved.
- Interventions should target drug shops to increase provision of efficacious drugs. Education targeting drug vendors could improve use of appropriate drugs and encourage referral for severe or complicated cases.
- Effective antimalarials need to be within reach of the community. Access to drugs needs to be improved at the lowest levels with products that are available at subsidized prices in the most frequented locations.
- Community medicine distributors could be trained to use available diagnostics. RDTs could improve case management and surveillance. Drug distributors could be trained to recognize rapid breathing and treat it as pneumonia.

Caregiver education must improve recognition of signs of dangerous or severe illness and motivate prompt care-seeking. Education for improving care-seeking must focus on rapid response to symptoms and must dispel common myths and dangerous practices that are detrimental to child health. Messages must convey the potentially serious nature of childhood illness to the caregiver and also reach those in the child's extended family. The role of mothers as decision-makers is increasing; however fathers are still often the head of households, and decisions may be influenced by the extended family structure or friends or neighbors of the child's caregiver. It is also essential that education is provided recurrently and reach the wider community. Caregiver education must overcome any misalignment between local terminology and biomedical concepts of disease and instead promote appropriate response to symptoms. Additional opportunities exist for educating caregivers who do seek help at facilities, to take advantage of this contact between caregivers and the health workforce to spread public health messages or to distribute materials.

When caregivers seek care in the community, community health workers are a common source of care, of education and information. It is essential that CHWs receive constantly updated and refreshed education, as they have a wide reach into communities and can serve hard-to-reach populations. Use of CHWs should be improved and their reach extended. In some areas coverage of CHWs and use of CHWs is quite low. Additionally, effective drugs need to be brought within reach of the community. Drug shops, drug distributors and CHWs are well-positioned to carry the supply to reach the lower levels and ensure accessibility and availability of treatments for children. Education targeting drug vendors could motivate the sale of appropriate drugs for the symptoms and encourage referral in severe or complicated cases. Interventions could target drug shops to improve demand for appropriate treatments and consequently

increase provision of efficacious drugs. Community medicine distributors could be trained to use available diagnostics like RDTs. This could improve both case management and surveillance efforts. Lay medicine distributors also could be trained to identify and treat rapid breathing as presumed pneumonia.

There were many similarities across settings concerning initial care-seeking practices. A common response to childhood illness was to provide initial care in the home or to obtain treatment from a nearby source. Many seek care from clinics or drug shops. Percentages of care-seekers who visit one source of care versus another does vary across locations and from urban to rural settings. Comparison of these proportions was difficult do to the different groupings of care providers across studies. Overall, there were rather low percentages of care-seekers reportedly going to traditional healers, numbering less than 10% of cases in most studies. There were apparent differences in care-seeking tendencies in rural compared to urban settings. More home treatment was administered in rural settings, while in urban areas, more care was sought outside the home. The sources of care sought, reflecting availability or accessibility to different types of care, differed from rural to urban settings. Messages and interventions to improve appropriate and prompt care-seeking would need to reflect these variances.

There were differences but also similarities concerning caregivers' perceptions of childhood illness across different country locations. Concepts surrounding teeth and teething as a source or cause of childhood illness were prevalent in nearly all country locations. In some settings in east Africa, a young child's false teeth (tooth buds) were believed to be the source of the illness, or that prolonged fever or diarrhea would cause the illness known as false teeth or plastic teeth in a child. A more universal idea across countries was that teething was associated with childhood fever or diarrhea.

One apparent finding from this review was that the burden of each of the childhood illnesses is not determinate of the amount of research pursued on the subject. The literature was far more heavily focused on malaria, while the burden of morbidity and mortality across the countries was more weighted by cases of pneumonia and diarrhea.

Policy Recommendations

One long-term policy focus must be **on improving geographic access to facility-based care**. Efforts must also improve economic access to care and remove the financial barriers. Partnerships through established community-based organizations (CBOs) could be an asset, particularly in special areas like remote rural areas or slums. Private health care providers and CBOs may be valuable partners in areas where there are few public facilities or where public facilities are not the main source of care.

Drugs should be available at subsidized prices, and subsidized treatments must be available at the locations where drugs are most commonly sought, including private providers and drug shops. Even in settings where user fees have been abolished at government facilities, and in areas with relatively good access to health services, and even where free or subsidized drugs are available from community medicine distributors, a large number of sick children are taken to drug shops and private clinics. For subsidized items, like first-line recommended treatments, standard prices could be set and consumers informed of prices through radio, press, promotion, and child health clinics.

A valuable role could be served by drug sellers, who are often the source of treatments for childhood illnesses. Retail drug sellers could be targeted to improve demand for appropriate treatments encourage referral for severe cases. Drug sellers may be trained to perform simple diagnostics, resulting in increased abilities and responsibilities and reward for drug sellers. Better engagement of drug sellers is necessary to restrict access to second-line treatments, as well.

Consumer drug and treatment preferences are strongly held and influential. These should be elucidated using market research to capitalize on people's innate beliefs about drug efficacy and to understand caregivers' preferences. This is critical for optimizing the marketing of public health messages and to promote uptake of treatments. Packaging needs to be innovative in order to convey appropriate dosage regimens for children of different ages. Ideally, a simpler dosage regimen would be established to improve adherence to drug regimens. This points to the needs for collaboration with research and development efforts to best adapt to consumer needs to ensure uptake and proper use of drugs.

Effective antimalarials and antibiotics need to be within reach of the community. Access needs to be improved at the lowest levels. Yet, in some locations, these drugs still require doctor's prescription, preventing optimal access to and uptake of these drugs in communities. Strategies are needed to increase access to drugs over-the counter and to prevent adult over-use where it is a problem. As a matter of national priority in each country: policies need to focus on improving adherence to treatment regimens to reduce risk of drug resistance.

As home-based management of childhood illness becomes more widely adopted, **guidelines need to be improved** to reflect best practices and lessons learned. And, adherence to the guidelines needs to be promoted. Guidelines for clinical practice must also reflect a more sensitive or entirely new and different approach to working with caregivers who present at clinics with a sick child. This may be central to aligning caregivers to work with clinicians to help ensure best care for the sick child, and allowing mothers to feel more empowered to contribute to the health of their children.

Marketing Approaches

Product presentation for ORS, zinc, antibiotics, antimalarials

Product presentation should be modified to fit the specific characteristics of the target audience. Based on market research, it would tune into the consumer's general and specific needs or desires. Concerning treatments for childhood illness, depending on the setting and the product, the target audience may vary from female caregivers to family members or other influencers.

Like with any other product, packaging of treatments for childhood illnesses was important for the consumers. Caregivers in one study were willing to pay more for pre-packaged drugs. Pre-packs of medications were perceived as cleaner and safer, and were packaged in the appropriate dose for the child. These packages were also liked by caregivers because they display an expiration date.

As observed in another study specifically exploring drug colors, caregivers have an impression about the efficacy of a drug because of its color. Also important to note was that consumers typically turned to a

drug they were familiar with rather than a new drug, unless guided by the seller or by a relative or friend who advised that the new drug was effective.

Consumers had perceptions associated with the mode of delivery of the drug. Intravenous malaria treatments seemed to influence caregivers' choices to seek care at a private facility where this was more commonly available. Caregivers expressed preferences concerning pills rather than syrup formulas. Pills were cited as easier to dose properly and easier for the caregiver to administer if they were outside their home or around their farm.

Location of services and products

Caregivers most often sought to purchase treatment for childhood illness from a drug shop or medicine vendor. These sources were nearby to consumers' homes, may have flexible hours of operation, may operate on a credit system, and may sell a portion of a dose if the full regimen cannot be afforded. Though nearby drug shops and sellers were often the most common source of treatment, hospital pharmacies were preferred for having higher-quality drugs, being able to perform diagnostics and to handle severe cases. They were mentioned, though, for the tendency to run out of drugs. Private providers were often sought because of their accessibility in rural areas, however, the quality of drugs available at private shops was doubted at times by caregivers. Ideally, locations would be most convenient to consumers, would be trusted, and would serve other needs. Market research analysis will elucidate such specific details of target populations and serve to direct marketing efforts.

Marketing of services and products

Marketing campaigns for essential childhood treatments must follow essential steps of marketing such as naming and branding and by developing a clear and memorable message. Innumerable approaches could then be implemented to carry forth the product name and emphasize its utility and integrate it into the lives of consumers. Tactics to market products might employ television, radio, or other forms of media or entertainment to convey messages to consumers. Ideally a catchy jingle or song may be developed. Products might be promoted by billboards, on signs within shops, or on promotional items like t-shirts or other goods that would be likely to be displayed around the target populations. Consumers must become familiarized with the name, the brand, the product. Other approaches include targeting specific locations where the product can be purchased, perhaps by painting drug shops with messages about the product, or furnishing large signs with names of shops that also carry the promotional messages. Regardless of the subsequent marketing approach, the logo and brand and messages developed will be instrumental to successfully capturing a place in the market and in the lives of the target consumers.

Limitations of the Studies

Household surveys are a valuable tool that can satisfy many aspects of scientific inquiry concerning illnesses and related behaviors. While this approach may present a number of inherent limitations, it proves quite valuable for uncovering insights concerning care for childhood illnesses and to identify further research questions. Qualitative methods, as well, are limited, though in this context allowed our increased understanding of perceptions concerning illnesses and care-seeking. Like with most qualitative studies and in light of the following limitations of the household surveys, the true scale of the problems

identified cannot be established with only this data, and the findings of each of these individual studies may not be generalized across populations.

Few studies in this review were based on a randomly selected sample. In many cases, the studies involved purposively selected participants, suggesting the research findings may not be generalizable. Many studies would choose to include a household based on the presence of a sick child at the time of the visit. This practice would predispose the studies to include more families with a larger number of children, since there is more likelihood for there to be a sick child. The characteristics and care-seeking behaviors of families with one child or fewer children may not be as well represented in these studies.

The purposively selected populations in many of the studies were advantageous in answering the research questions at hand; for example some studies selected only mothers whose children were ill, or whose children were diagnosed with the illness being studied, ensuring inclusion of a larger relevant sample. But these studies present only a snapshot, and are not representative of the populations at large. Without random sampling, the children studied are not representative, (e.g. they may be children who are more prone to illness), and the caregivers are not representative (e.g. they may be caregivers who better identify illness in their children). Similarly, in some studies, data was collected from mothers presenting at a health care facility, results which cannot be extrapolated to all mothers in an area.

In some studies, data was collected from a "third party" who suggested opinions and possible beliefs of caregivers, rather than interviewing the caregivers themselves. This may not accurately represent the perceptions of the caregivers, or may overstate or understate beliefs and practices. In one example, drug distributors and health workers conveyed with great concern that mothers saw a medication as a light drug, but caretakers themselves did not dwell much on this idea.

The geographic sampling of the studies may have also captured data that is from socially and culturally homogenous areas, in which case findings may not be generalizable to other areas or regions.

Internal validity of some of the studies may be compromised due to the large number of interviewers involved and varying qualifications of the interviewers. Some studies took place across multiple countries and involved thousands of participants and dozens of data collectors. In addition to this inter-observer variability in measuring study items, different methods were used for data collection, different measures were used, different definitions were applied, and data was categorized differently in the findings across the studies. As such, data was not grouped easily across studies, and is, at best, an estimate.

One example of variation in measure across studies is timing of treatment seeking: some studies measure delays in care-seeking as waiting more than an estimated 24 hours from symptom onset, whereas other studies measured if care was delayed more than one night. In rural areas especially, the measure of time from illness onset to treatment may be inaccurate, as time of day for many people is indicated by position of the sun or events taking place. Some studies tried to overcome this by measuring passage of time by counting nights, whereas others tried to estimate the true passing of a 24-hour period.

Definitions across studies differed in many ways. Some authors characterized "care-seeking outside the home" to include visits to the retail sector. For other articles, any administration of medicine in the home

without first seeking a licensed health provider's advice was considered "home care". Some studies grouped providers as either public or private, and others differentiated by specific type of provider. Only some studies clarified if "private providers" described only those practitioners who were licensed. Across studies, the groupings of providers differed. As well, across regions, urban/rural settings, and across countries, different types of providers are available in different locations.

Additionally, different providers have different fees associated with services or drugs provided in the different geographic locations. The relative costs of providers were not always provided, though this would clearly impact the demand for their services. Another known factor that influences care seeking is distance to a provider. While studies noted distance as barrier to care or reason for delaying care-seeking, the availability of providers in an area or the actual distances from households to different providers were not reported.

The definition of medical and disease terms across studies was another variation and limitation, attributable mostly to language. In some studies, the local term for an illness did not necessarily represent one specific biomedical disease. In some malaria studies, for example, the term for fever was used, possibly representing a number of common childhood febrile illnesses, whereas in other studies, the local term represented a combination of symptoms that might indicate a true clinical representation of malaria. These limitations were identified within some of the quantitative studies, and in addition, were uncovered during qualitative explorations of disease perceptions. In addition, the studies of pneumonia in Uganda pointed to difficulty in finding direct translations for "fast breathing" and "rapid breathing" in the local language and indicate the challenge of obtaining a standard case definition for this illness, as well.

In most studies, severity signs and symptoms were not assessed by study staff or by medical personnel at any point during illness. Having solely the caregivers' perceptions of their children's illnesses may have mistakenly allowed the captured of misclassification of both cases and controls in many of the included studies. There were very few cases of verification with diagnostics for true malaria parasitemia or chest x-ray for pneumonia, and in one case where diagnostics were obtained, the quality control of the laboratory was brought into question. A differential misclassification may have overestimated the presence of the childhood illnesses perceived to be most common. And, as such, the over-diagnosis of malaria might occur in study areas where malaria is endemic.

In combination with the above-mentioned difficulty of assessing the passage of time in the rural setting, the difficulty in conveying disease terminology and severity signs of illnesses in the local language, and the potential challenge for non-medically trained caregivers to recognize severe symptoms, it is extremely difficult to assess if caregivers presented for clinical care in the appropriate amount of time. For some studies 24-hours from symptom onset was estimated, while for other studies working with rural populations, care-seeking before nightfall or after one night was used as a proxy measure of 24 hour periods.

Treatment seeking behavior is suggested in a number of studies to be affected by severity signs of illness, yet in many circumstances, perceived severity signs were not assessed. From the retrospective studies, the quality of care provided cannot be assessed. Similarly, the appropriateness of care-seeking and its timing, and the quality and correctness of treatments provided can at best be taken as an approximation.

Many of the studies assess disease symptoms retrospectively, which may be a subjective method and may be prone to recall bias. Most studies used a 2-week recall period and such interviews pose questions to reliability and validity of findings. In general, severe symptoms are remembered longer than mild symptoms. Diarrheal illness in particular is likely to be underreported more than 7 days after illness. It may be difficult to assess signs of dehydration in retrospect, as well as symptoms and disease progression of other illnesses.

Recall decay is suggested to occur also, where memory of health facility visits decreases with time. Health-seeking behaviors may not be accurately reported if they took place more than a few days prior to a bi-weekly inquiry. In the case where the caregiver forgets about practices, positive care-seeking may be over-reported in an attempt to appease the survey staff. Most studies did not assess blood levels of drugs reportedly administered, and caregivers' reported use of drugs may differ from that which would be found when performing blood analyses. Caregivers may provide information they believe is desirable or acceptable. Alternatively, information may be exaggerated under a misconception that study staff will provide assistance. Like all questionnaire-based cross-sectional studies, most of these studies are limited by these and other potential recall and information biases. Yet, even as such, the findings and insights offered by these dozens of studies are of immeasurable value to inform solutions to reduce the burden of childhood illness and under-five mortality around the world.

Recommendations for Further Research

Upon review of available literature concerning care-seeking for childhood illness, many specific research questions remain. There are many unknown aspects, and many findings may change over time. Specific questions that were not answered within the research complied include:

How influential are each of the motivations that affect care seeking, such as nearby location, hours of operation, or perceived quality of care or quality of drugs available?

Is a lower price of treatment most critical for a caregiver, or is a flexible payment option more important?

How do caregivers' local perceptions surrounding childhood illnesses impact the care that children receive?

What are the impacts of simplified treatment regimens or pre-packaged drugs on child mortality rates?

What is the cure rate when medicines are administered through an approach like HMM compared to provider-based care?

There is a great need for additional research, of both quantitative and qualitative natures. Both household surveys and other community-based structured questionnaires will be informative and complementary to qualitative research that will better uncover underlying motivations and beliefs.

Structured questionnaires: Needs, Resources, Population, Perceptions, Practices

Maintaining community-based surveillance is essential, to ensure accurate representation and distribution of the burden of disease. In combination with data on the facility, local, regional and national level, this can ensure the true and accurate illustration of disease prevalence. Conducting of household surveys allow the capture of background information on child health needs, characteristics of the populations of interest, and even data concerning perceptions or current practices. Such data build a sturdy foundation on which interventions can be designed to be feasible, take advantage of and incorporate available community resources, and be most likely to be adopted by the target population.

Structured questionnaires are needed to elucidate current practices in response to childhood illness. For example, diarrhea treatment practices in many locations are poorly documented and there is also a dearth of evidence on use of zinc and common sources for obtaining zinc. Such information is truly needed in each geographic locale and concerning each common childhood illness to optimize interventions. Additional factors of a population of interest, like socio-economic or geographic equity, occupation, parity or age of the target population need to be determined in different target areas.

In some settings, both caregivers and providers may be very entrenched in behaviors in response to childhood illness, either relying on traditional treatments or in overuse of antibiotics. One weakness of many studies was that they relied on caregiver reports, rather than biomedical validations when it comes to drugs administered or actual diagnosis of disease. Many malaria studies, for example, rely on caregiver's report of fever rather than actual parasitemia. Studies also report that caregivers commonly administer leftover drugs they have in the home to the child, yet details of such practices, such as types of medicines or storage practices are not known.

Many reports cited cost as a determinant of care-seeking, but costs of treatments were not reported in the studies. To truly understand the impact of cost on a caregiver's decision to delay care or where to seek care, future inquiries might address actual costs of treatments, or willingness to pay for treatments that are more convenient or perceived to be better-quality.

While not explicitly the focus of this report, provider practices are another area that might be better explored. Further information might uncover what provider practices might increase informed demand among caregivers.

One important aspect reiterated throughout the literature was the need to provide educational interventions to convey the serious nature of symptoms that indicate severe or rapidly progressing illness. In this sense, it will be critical to reach caregivers and the community with messages that are well-tested.

Additionally, as access to products is scaled-up, it will be important to continually measure equity in access. This is important to determine across geographic areas and across SES quintiles.

Qualitative Research: Behaviors, Motivations, Care-seeking Choices

Qualitative methods allow a better understanding of the interactions of context, culture, values, and local beliefs. Such approaches allow perceptions, ideas and concerns to best uncovered and inform effective construction of subsequent measures, or effective design of subsequent interventions.

Qualitative research is needed in many locations where interventions to improve care-seeking are required. This type of research can inform on behaviors and motivations of care-seekers that may be specific to regions or settings. This is an essential first step to in program development and in adapting programs appropriately for a population.

Understandings of perceptions concerning childhood illness are limited. Concerning diarrhea, malaria and rapid breathing, we have little knowledge about the beliefs of caregivers or beliefs of those who provide advice to caregivers. It has been found that beliefs concerning etiology do influence choices, but what is not known is the extent to which beliefs affect choices of caregivers. Many more questions must be elucidated to understand the steps or reasoning leading to care-seeking decisions, to know how interventions can be most effective and best reach caregivers.

Another factor not well understood is how beliefs, resources, families and institutions all interplay to affect patterns of decision-making. Little is known about the social processes that impact treatment-seeking decisions in different settings.

Focus group discussions may be a time-effective and valuable means to better understand behaviors. They may also be a valuable forum to test messages or marketing approaches. Post-intervention, this approach may allow a means for feedback on perceived successes or weaknesses of programs.

Although there are many similarities among communities within countries and their child survival problems, there are significant differences in resources available to address the problems and in the way the problems are perceived by members and leaders of those communities.

Powerful, locally appropriate programs need to be implemented to increase uptake of interventions and address misconceptions. This may be especially critical where there are new interventions, such as the introduction of home-based management, changes in recommended antimalarials, or introduction of zinc for treating diarrhea.

Catholic Relief Services Kenya Program Midterm Evaluation Report (July 25 – August 11, 2005) External Evaluator, Della Dash, Submitted to USAID

Edson WN, B. M., Koniz-Booher P, Djibrina S, Mahamane I (2004). Developing job aids to increase adherence to an antibiotic regimen in children with pneumonia in Niger. Operations Research Results. Bethesda, MD.

Ethiopian Ministry of Health 2009. Ethiopia National Malaria Indicator Survey. Ethiopia: Ministry of health.

Federal Ministry of Health. Saving newborn lives in Nigeria: Newborn health in the context of the Integrated Maternal, Newborn and Child Health Strategy. 2nd edition. Abuja: Federal Ministry of Health, Save the Children, Jhpiego; 2011

Healthy Child Uganda Community Owned Resource Persons Model, Healthy Child Uganda (HCU), May 2010, www.healthychilduganda.org

Kenya Child Survival and Development 2009 February UNICEF. Accessed January 4, 2011 www.unicef.org%2Fkenya%2FKenya - Child Survival and Development February 2009.pdf

Kosimbei, George Child Healthcare Seeking Behaviour in Kenya KIPPRA Discussion Paper No. 50, December 2005. Kenya Institute for Public Policy Research and Analysis

Lukwago, Daniel. The Tragedy of Uganda's Healthcare System: The Case of Paminya Health Center III, Nebbi District. Advocates Coalition for Development and Environment Citizens Budget Tracking and Information Center (CBTIC) Infosheet No. 9, 2010 www.acode-u.org/publication.
Lukwago, Daniel. "The Tragedy of Uganda's Healthcare System: The Case of Kawaala Health Center III, Kampala District" Advocates Coalition for Development and Environment (ACODE) Infosheet No.10, 2011 www.acode-u.org/publication.

Maternal and Child Survival in Nigeria. Sustaining Progress; Removing Bottlenecks. Health SITAN 2010. October 2010 Maternal and Child Survival in Nigeria - Sustaining Progress; Removing Bottlenecks

National Population Commission (NPC) [Nigeria] and ICF Macro. 2009. Nigeria Demographic and Health Survey 2008. Abuja, Nigeria: National Population Commission and ICF Macro.

Page, A.-L., S. Hustache, et al. (2011). "Health care seeking behavior for diarrhea in children under 5 in rural Niger: results of a cross-sectional survey." BMC public health 11: 389.

Souley, A. (2010). Enquête relative aux aspects socioculturels et leur impact sur l'état de santé (et la nutrition) des enfants dans le département de Mayahi. Mayahi.

Souley, A. (2011). Connaissances, attitudes et pratiques en santé de l'enfant dans la region de Zinder. Zinder.

The Last Ten Kilometers Project. Baseline Household Health Survey Summary Report. JSI Research & Training Institute Inc. JSI Research & Training, Inc., Addis Ababa, Ethiopia. 2009

The World Bank 2004. A country status report on health and poverty. Ethiopia: The World Bank.

Uganda Bureau of Statistics (UBOS) and Macro International Inc. 2007. Uganda Demographic and Health Survey 2006. Calverton, Maryland, USA: UBOS and Macro International Inc

USAID/Essential Services for Health in Ethiopia (ESHE). Household End-line Survey Synthesis Report. Addis Ababa, 2008.

USAID/KENYA FIVE YEAR IMPLEMENTATION FRAMEWORK FOR THE HEALTH SECTOR (2010-2015), January 2010, Government of Kenya and USAID/K

Wamae, Annah, George Kichamu, Francis Kundu, and Irene Muhunzu. 2009. Child Health Services in Kenya. Kenya Working Papers No. 2. Calverton, Maryland, USA: Macro International Inc.

Workshop Report of The Maternal, Newborn Health, Child Survival and Development Retreat, Bontana Hotel, Nakuru, Kenya 15-17 March 2010

References

1. UNICEF., *State of the world's children*. 2011, New York: United Nations Children's Fund.
2. Black, R.E., et al., *Global, regional, and national causes of child mortality in 2008: a systematic analysis.* Lancet, 2010. **375**(9730): p. 1969-87.
3. Victora, C.G., et al., *Applying an equity lens to child health and mortality: more of the same is not enough.* Lancet, 2003. **362**(9379): p. 233-41.
4. Wagstaff, A., et al., *Child health: reaching the poor.* Am J Public Health, 2004. **94**(5): p. 726-36.
5. Schellenberg JA, V.C., Mushi A, de Savigny D, Schellenberg D, Mshinda H, Bryce J; Tanzania Integrated Management of Childhood Illness MCE Baseline Household Survey Study Group. Inequities among the very poor: health care for children in rural southern Tanzania. Lancet. 2003 Feb 15; 361 (9357):561-6.
6. Akin, J. and P. Hutchinson, *Health care facility choice and the phenomenon of bypassing*. . Health Policy and Planning, 1999. **14**: p. 135-151.
7. Castro-Leal, F., et al., *Public spending on health care in Africa: do the poor benefit?* Bulletin of the World Health Organization, 2000. **1**: p. 66-74.
8. Thomas, D., V. Lavy, and D. Strauss, *Public policy and anthropometric outcomes in the Cote d'Ivoire*. Journal of Public Economics, 1996. **61**: p. 155-192.
9. Lavy, V., et al., *Quality of care, survival and health outcomes in Ghana.* . Journal of Health Economics, 1996. **15**: p. 333-357.
10. Narayan, D., et al., *Voices of the Poor: Can Anyone Hear Us?* 2000, New York, NY: Oxford University Press.
11. Jones, G., et al., *How many child deaths can we prevent this year?* Lancet, 2003. **362**(9377): p. 65-71.
12. Ensor, T. and S. Cooper, *"Overcoming Barriers to Health Services Access and Influencing the Demand Side Through Purchasing". Health, Nutrition and Population (HNP) Discussion Paper*. 2004, World Bank.
13. World Bank. *World Development Indicators Database*. 2011 January 4, 2011]; Available from: http://publications.worldbank.org/WDI/.

14. Bhutta, Z.A., et al., *Countdown to 2015 decade report (2000-10): taking stock of maternal, newborn, and child survival.* Lancet, 2010. **375**(9730): p. 2032-44.
15. http://www.unicef.org/infobycountry/ethiopia_statistics.html.
16. Jima, D., et al., *Malaria indicator survey 2007, Ethiopia: coverage and use of major malaria prevention and control interventions.* Malaria journal, 2010. **9**: p. 58.
17. Getahun, A., K. Deribe, and A. Deribew, *Determinants of delay in malaria treatment-seeking behaviour for under-five children in south-west Ethiopia: a case control study.* Malaria Journal, 2010. **9**(1): p. 320.
18. Deressa, W., *Treatment-seeking behaviour for febrile illness in an area of seasonal malaria transmission in rural Ethiopia.* Malaria Journal, 2007. **6**(1): p. 49.
19. Deressa, W., A. Ali, and Y. Berhane, *Maternal responses to childhood febrile illnesses in an area of seasonal malaria transmission in rural Ethiopia.* Acta Tropica, 2007. **102**(1): p. 1-9.
20. Akweongo, P., et al., *Feasibility and acceptability of ACT for the community case management of malaria in urban settings in five African sites.* Malaria Journal, 2011. **10**(1): p. 240.
21. Deressa, W., A. Ali, and D. Hailemariam, *Malaria-Related Health-Seeking Behaviour and Challenges for Care Providers in Rural Ethiopia: Implications for Control.* Journal of Biosocial Science, 2008. **40**(01).
22. Deressa, W. and A. Ali, *Malaria-related perceptions and practices of women with children under the age of five years in rural Ethiopia.* BMC Public Health, 2009. **9**(1): p. 259.
23. Deressa, W., A. Ali, and Y. Berhane, *Household and socioeconomic factors associated with childhood febrile illnesses and treatment seeking behaviour in an area of epidemic malaria in rural Ethiopia.* Transactions of the Royal Society of Tropical Medicine and Hygiene, 2007. **101**(9): p. 939-947.
24. Hwang, J., et al., *Knowledge of malaria and its association with malaria-related behaviors--results from the Malaria Indicator Survey, Ethiopia, 2007.* PloS one, 2010. **5**: p. e11692.
25. Hwang, J., et al., *Knowledge of Malaria and Its Association with Malaria-Related Behaviors—Results from the Malaria Indicator Survey, Ethiopia, 2007.* PLoS ONE, 2010. **5**(7): p. e11692.
26. Kenya National Bureau of Statistics (KNBS) and ICF Macro. 2010. *Kenya Demographic and Health Survey 2008-09*. Calverton, M.K.a.I.M.
27. Central Bureau of Statistics (CBS) [Kenya], M.o.H.M.K., and ORC Macro. 2004. *Kenya Demographic and Health Survey 2003.* Calverton, Maryland: CBS, MOH, and ORC Macro.
28. Mbagaya, G.M., et al., *Mother ' s health seeking behaviour during child illness in a rural wes- tern Kenya community.* African Health Sciences, 2005. **1125**: p. 322-327.
29. Taffa, N. and G. Chepngeno, *Determinants of health care seeking for childhood illnesses in Nairobi slums.* Tropical medicine & international health : TM & IH, 2005. **10**: p. 240-5.
30. Amuyunzu-Nyamongo, M. and I.K. Nyamongo, *Health Seeking Behaviour of Mothers of Under-Five-Year-Old Children in the Slum Communities of Nairobi, Kenya.* Anthropology & Medicine, 2006. **13**(1): p. 25-40.
31. Opwora, A.S., et al., *Who is to blame? Perspectives of caregivers on barriers to accessing healthcare for the under-fives in Butere District, Western Kenya.* BMC Public Health, 2011. **11**(1): p. 272.
32. Molyneux, C.S., et al., *Intra-household relations and treatment decision-making for childhood illness: a Kenyan case study.* Journal of biosocial science, 2002. **34**: p. 109-31.
33. Bigogo, G., et al., *Health-seeking patterns among participants of population-based morbidity surveillance in rural western Kenya: implications for calculating disease rates.* International Journal of Infectious Diseases, 2010. **14**(11): p. e967-e973.

34. Simiyu, D.E., E.M. Wafula, and R.W. Nduati, *Mothers' knowledge, attitudes and practices regarding acute respiratory infections in children in Baringo District, Kenya.* East Afr Med J, 2003. **80**(6): p. 303-7.
35. Irimu, G., et al., *Community understanding of pneumonia in Kenya.* African health sciences, 2008. **8**: p. 103-7.
36. Burton, D.C., et al., *Healthcare-seeking Behaviour for Common Infectious Disease-related Illnesses in Rural Kenya: A Community-based House-to-house Survey.* Journal of Health, Population, and Nutrition, 2011. **29**: p. 61.
37. Hamel, M.J., et al., *Malaria control in Bungoma District, Kenya: a survey of home treatment of children with fever, bednet use and attendance at antenatal clinics.* Bulletin of the World Health Organization, 2001. **79**: p. 1014-23.
38. Osero, J.S., M.F. Otieno, and A.S. Orago, *Mothers' knowledge on malaria and vector management strategies in Nyamira District, Kenya.* East Afr Med J, 2006. **83**(9): p. 507-14.
39. Enato, E.F.O. and A.O. Okhamafe, *A survey of anti-malarial activity during pregnancy, and children's malaria care-seeking behaviour in two Nigerian rural communities.* Scandinavian Journal of Infectious Diseases, 2006. **38**(6-7): p. 474-478.
40. Iwelunmor, J., et al., *Child malaria treatment decisions by mothers of children less than five years of age attending an outpatient clinic in south-west Nigeria: an application of the PEN-3 cultural model.* Malaria Journal, 2010. **9**(1): p. 354.
41. Kakai, R., D. Menya, and W. Odero, *Supporting formal education to improve quality of health care provided by mothers of children with malaria in rural western Kenya.* Public Health, 2009.
42. Abuya, T.O., et al., *Use of over-the-counter malaria medicines in children and adults in three districts in Kenya: implications for private medicine retailer interventions.* Malaria Journal, 2007. **6**(1): p. 57.
43. Othero, D.M., et al., *Home management of diarrhea among underfives in a rural community in Kenya: household perceptions and practices.* East African journal of public health, 2008. **5**: p. 142-6.
44. Mutai, J., et al., *Socio-cultural practices of deciduous canine tooth bud removal among Maasai children.* International Dental Journal, 2010: p. 94-98.
45. Breiman, R.F., et al., *Healthcare-use for major infectious disease syndromes in an informal settlement in Nairobi, Kenya.* Journal of health, population, and nutrition, 2011. **29**: p. 123-33.
46. Simiyu, *Simiyu_2003 Mothers Knowl Px ARI Baringo Kenya.pdf*. 2003.
47. Amin, A.a., et al., *The use of formal and informal curative services in the management of paediatric fevers in four districts in Kenya.* Tropical medicine & international health : TM & IH, 2003. **8**: p. 1143-52.
48. Guyatt, H.L. and R.W. Snow, *The management of fevers in Kenyan children and adults in an area of seasonal malaria transmission.* Transactions of the Royal Society of Tropical Medicine and Hygiene, 2004. **98**(2): p. 111-115.
49. Souley, A., *Connaissances, attitudes et pratiques en santé de l'enfant dans la region de Zinder*. 2011: Zinder.
50. Souley, A., *Enquête relative aux aspects socioculturels et leur impact sur l'état de santé (et la nutrition) des enfants dans le département de Mayahi*. 2010: Mayahi.
51. Edson WN, B.M., Koniz-Booher P, Djibrina S, Mahamane I, *Developing job aids to increase adherence to an antibiotic regimen in children with pneumonia in Niger*, in *Operations Research Results*. 2004: Bethesda, MD.
52. Page, A.-L., et al., *Health care seeking behavior for diarrhea in children under 5 in rural Niger: results of a cross-sectional survey.* BMC public health, 2011. **11**: p. 389.
53. http://www.unicef.org/infobycountry/nigeria_statistics.html.

54. Olaogun, A., et al., *Knowledge and management of infants' pain by mothers in Ile Ife, Nigeria.* International Journal of Nursing Practice, 2008. **14**(4): p. 273-278.
55. Falade, C.O., et al., *The influence of cultural perception of causation, complications, and severity of childhood malaria on determinants of treatment and preventive pathways.* International quarterly of community health education, 2006. **24**: p. 347-63.
56. Tinuade, O., R.-A. Iyabo, and O. Durotoye, *Health-care-seeking behaviour for childhood illnesses in a resource-poor setting.* Journal of Paediatrics and Child Health, 2010. **46**(5): p. 238-242.
57. Dada, O.a. and F.O. Omokhodion, *Home management of malaria by mothers of children under-five in Abeokuta, Southwest Nigeria.* Tropical doctor, 2007. **37**: p. 217-9.
58. Okeke, T.A. and J.C. Okeibunor, *Rural–urban differences in health-seeking for the treatment of childhood malaria in south-east Nigeria.* Health Policy, 2010. **95**(1): p. 62-68.
59. Charles, J.O., et al., *The Role of Mothers in Household Health-Seeking Behavior and Decision-Making in Childhood Febrile Illness in Okurikang/Ikot Effiong Otop Community, Cross River State, Nigeria.* Health Care for Women International, 2008. **29**(8): p. 906-925.
60. Wagbatsoma, V.A., O. Aimuengheuwa, and J. Agabi, *Assessment of abdominal scarification as a treatment for malaria-induced splenomegaly in a rural community: Implications for child health.* Vulnerable Children and Youth Studies, 2007. **2**(2): p. 106-115.
61. Uzochukwu, B.S.C., et al., *Rural-urban differences in maternal responses to childhood fever in South East Nigeria.* PloS one, 2008. **3**: p. e1788.
62. Adimorah, G.N., A.C. Ubesie, and J.M. Chinawa, *Mothers' beliefs about infant teething in Enugu, South-east Nigeria: a cross sectional study.* BMC Research Notes, 2011. **4**(1): p. 228.
63. Brieger, W., K. Salami, and F. Oshiname, *Perceptions of drug color among drug sellers and consumers in rural southwestern Nigeria.* Research in Social and Administrative Pharmacy, 2007. **3**(3): p. 303-319.
64. Uchendu, U.O., I.J. Emodi, and a.N. Ikefuna, *Pre-hospital management of diarrhoea among caregivers presenting at a tertiary health institution: implications for practice and health education.* African health sciences, 2011. **11**: p. 41-7.
65. Ebuehi, O.M. and S. Adebajo, *Improving caregivers' home management of common childhood illnesses through community level interventions.* Journal of Child Health Care, 2010. **14**(3): p. 225-238.
66. Chirdan, O., A. Zoakah, and C. Ejembi, *Impact of health education on home treatment and prevention of malaria in Jengre, North Central Nigeria.* Annals of African Medicine, 2008. **7**(3): p. 5-11.
67. Uzochukwu, B.S.C., et al., *Households' perceptions and prioritization of tropical endemic diseases in Nigeria: implications for priority setting for resource allocation.* World health & population, 2007. **9**: p. 36-47.
68. Hildenwall, H., et al., *Care-seeking in the development of severe community acquired pneumonia in Ugandan children.* Annals of Tropical Paediatrics: International Child Health, 2009. **29**(4): p. 281-289.
69. Källander, K., et al., *Home and community management of acute respiratory infections in children in eight Ugandan districts.* Annals of Tropical Paediatrics: International Child Health, 2005. **25**(4): p. 283-291.
70. Mbonye, A.K., *Prevalence of Childhood Illnesses and Care-Seeking Practices in Rural Uganda.* TheScientificWorldJOURNAL, 2003. **3**: p. 721-730.
71. Tumwesigire, S. and S. Watson, *Health seeking behavior by families of children suspected to have malaria in Kabale: Uganda.* African health sciences, 2002. **2**: p. 94-8.

72. Njama, D., et al., *Urban malaria: primary caregivers' knowledge, attitudes, practices and predictors of malaria incidence in a cohort of Ugandan children.* Tropical medicine & international health : TM & IH, 2003. **8**: p. 685-92.
73. Byakika-Kibwika, P., G. Ndeezi, and M.R. Kamya, *Health care related factors associated with severe malaria in children in Kampala, Uganda.* African health sciences, 2009. **9**: p. 206-10.
74. Nsungwa-Sabiiti, J., et al., *Local fever illness classifications: implications for home management of malaria strategies.* Tropical medicine & international health : TM & IH, 2004. **9**: p. 1191-9.
75. Rutebemberwa, E., et al., *Utilization of public or private health care providers by febrile children after user fee removal in Uganda.* Malaria Journal, 2009. **8**(1): p. 45.
76. Rutebemberwa, E., et al., *Determinants of delay in care-seeking for febrile children in eastern Uganda.* Tropical Medicine & International Health, 2009. **14**(4): p. 472-479.
77. Rutebemberwa, E., et al., *Use of drugs, perceived drug efficacy and preferred providers for febrile children: implications for home management of fever.* Malaria Journal, 2009. **8**(1): p. 131.
78. Malimbo, M., et al., *Caregivers' perceived treatment failure in home-based management of fever among Ugandan children aged less than five years.* Malaria journal, 2006. **5**: p. 124.
79. Kilian, a.H.D., et al., *Attitude of women in western Uganda towards pre-packed, unit-dosed malaria treatment for children.* Tropical medicine & international health : TM & IH, 2003. **8**: p. 431-8.
80. Nsabagasani, X., et al., *Home-based management of fever in rural Uganda: community perceptions and provider opinions.* Malaria journal, 2007. **6**: p. 11.
81. Mbonye, A.K., *Risk factors for diarrhoea and upper respiratory tract infections among children in a rural area of Uganda.* J Health Popul Nutr, 2004. **22**(1): p. 52-8.
82. Jamieson, L., *Using qualitative methodology to elucidate themes for a traditional tooth gauging education tool for use in a remote Ugandan community.* Health Education Research, 2005. **21**(4): p. 477-487.
83. Nuwaha, F., et al., *False teeth "Ebiino" and Millet disease "Oburo" in Bushenyi district of Uganda.* African health sciences, 2007. **7**: p. 25-32.
84. Hildenwall, H., et al., *Local illness concepts—Implications for management of childhood pneumonia in eastern Uganda.* Acta Tropica, 2007. **101**(3): p. 217-224.
85. Nsungwa-Sabiiti, J., et al., *Home-based management of fever and malaria treatment practices in Uganda.* Transactions of the Royal Society of Tropical Medicine and Hygiene, 2007. **101**(12): p. 1199-1207.
86. Kolaczinski, J.H., et al., *Adherence of community caretakers of children to pre-packaged antimalarial medicines (HOMAPAK) among internally displaced people in Gulu district, Uganda.* Malaria journal, 2006. **5**: p. 40.
87. Yablonski, J. and M. O'Donnell, *"Lasting Benefits. The role of cash transfers in tacking child mortality". Save the Children UK.* 2009.
88. Lawn, J., Kinney MV, and Kerber KJ, eds., , *Science in action: Saving the lives of Africa's mothers, newborns, and children*, in *Report for the Academy of Science Development Initiative*. 2009: Cape Town, South Africa.