

An In-depth Examination of Health Systems and Careseeking for the Sick Child in DR Congo

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Project AXxes

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I. BACKGROUND

1.1 The Country Context

Over the past 10 years, the Democratic Republic of Congo (DRC) has experienced one of the worst humanitarian crises in the world in which the unnecessary death and suffering of millions of people occurred with an estimated 5.4 million deaths in excess of the norm between August 1998 and April 2007.¹ In addition to the mass displacement of populations, elevated mortality rates are associated with the collapse of health infrastructures and quality health care services, along with severe food shortages, with most deaths attributed to treatable conditions such as malaria, waterborne and respiratory infections and malnutrition.

Children are particularly vulnerable in these conditions. DRC claims some of the worst health indicators in the world, with infant mortality and child mortality rates reported at 92 and 148 deaths per 1,000 live births, respectively.² The three leading causes of under-five child deaths include malaria (25-30%), diarrhea (16%), and pneumonia (16%), and utilization of medical health services is low, with treatment sought in a health facility or with medical personnel for 42 percent of children having symptoms of acute respiratory infections (ARI) and 45 percent of young children with fever.² In regard to diarrhea treatment, 45 percent of children were given ORT (oral rehydration therapy), and 20 percent received no treatment. Vaccination coverage also remains low, with only 31 percent of children having completed a full series and 18 percent of children 12-23 months having received no vaccinations, causing the re-emergence of diseases such as polio that had been previously eradicated in the country.²

Since independence, the health sector has been allocated a minimum share of the central government budget. Presently, the government health budget constitutes 2 percent of the national budget, giving DRC among the lowest per capita health expenditure in the world.³ Correspondingly, health zones under government control receive virtually no funding to provide health services, and salaries of government health workers are negligible, if paid at all. Government institutions suffering from years of neglect and war have been destroyed and now require both technical and physical rehabilitation. As a result, most government health facilities fail to function, and trained health care providers resort to other means of compensation, such as the sale of medicines and establishment of private, unregulated clinics without any semblance of standard care. Because of an overall increase in poverty, many people cannot pay for care from trained providers or buy essential medicines, forcing them to resort to self treatment and traditional remedies. As the situation deteriorates, non-governmental organizations (NGOs) are assuming the role of government in the management of health zones, which appears to be the only viable approach that can ensure in the near term availability of vital health services. Recommendations have been made to prioritize the most marginalized populations, particularly children and women.

In 1980, the country adopted the policy of primary health care as a national strategy in an attempt to make health care more accessible to its widely dispersed population. As part of the approach, the DRC was divided into 515 health zones (HZ), with each HZ designed to serve approximately 100,000 inhabitants in rural and 150,000 persons in urban areas. In theory, a health zone consists of a referral hospital and a constellation of Health Centers (CS) and Health Posts (PS). Health

zone activities are coordinated by a medical officer (Médecin Chef de Zone or MCZ), an administrator, a nursing supervisor, and a pharmacist. Services are further coordinated at the district, provincial and national level.

1.2 SANRU Rural Health Program

Operating since 1981, SANRU is the leading program for implementation of primary health care in DRC. The current SANRU program assists 118 of Congo's 515 health zones to reduce morbidity and mortality with a minimum package of activities as defined by the Ministry of Health (MOH). Critical components of the intervention are:

- Support of health zone central office activities (equipment, supervision, e.g.)
- Training of health providers
- Activities related to disease control
- Supply of drugs/medicines
- Behaviour change communication
- Management/planning
- Development of health management information systems
- Supervision
- Operational research

Funded by USAID, AXxes is one of several projects within the SANRU program, with a focus on supporting health zones in the east and center of the country. A major emphasis of the Project AXxes involves access to curative health care. A study conducted at the outset of the project examined utilization rates of health facilities by district in the AXxes project areas. The results uncovered large variations in utilization of health facilities for treatment purposes, with some districts in South Kivu maintaining rates of 71 percent while others in Kasai (Mbuji Mayi, Kananga, Tshilenge) showing the utilization of health facilities for treatment purposes as low as 35 percent. Alternative forms of treatment used in order of importance included self medication, no treatment, hospital care, private clinics and traditional healers. Factors identified as influencing health careseeking were confidence in treatment provided, geographic location, and cost. More recent monitoring data collected at the health center level suggests that even after full implementation of facility services, including stocking of medications, training of health workers on correct use of curative protocols, and supervision of health facilities, utilization of health centers for treatment purposes remain low in certain health zones. Interestingly, vaccination rates of children in the same AXxes zones appear to be relatively high, despite equal distances to the health centers. It is critical to understand why these wide variations exist and to identify possible measures to improve utilization of curative services in low performing zones.

We conducted qualitative research to examine home care and careseeking behaviours for the three leading causes of child mortality, malaria, diarrhea and ARI, and to identify barriers and facilitators to seeking care in health centers with trained providers. Specific objectives included: to identify local illness terminologies, perceived signs and symptoms by which mothers recognize illness and seek treatment, and causal explanations; to identify beliefs regarding home remedies and medications, and other aspects of home management for the sick child; to delineate health seeking practices during illness episodes and understand

choice of care; to recognize cultural characteristics and social conditions that constitute barriers to seeking care and determine possible solutions to overcome these barriers; and to examine aspects of the health systems that affect careseeking. The information will be used to develop recommendations to the government whereby access to skilled health care will be better ensured and to design messages to promote timely and appropriate careseeking in a culturally relevant and feasible way. The prevailing aim is to identify successful strategies and messages that can be applied to the regions under study and around the country in order to improve the overall health of the population.

II. RESEARCH METHODS

2.1 Study Sites

Formative research was carried out between November 2008 and February 2009 in two provinces, including Kolwezi District in Katanga Province and two adjacent districts in South Kivu including North and Central Districts. In each province, we selected one higher performing health zone (Dilala in Kolwezi and Nyangezi in Central) and one lower performing health zone (Kanzenze in Kolwezi and Miti Murhesa in North) in terms of utilization of curative health services to examine factors contributing to careseeking. In all four health zones, vaccination coverage was high, with over 90 percent coverage of children under five.

2.1.1 North and Central Districts, South Kivu

North and Central Districts are located in South Kivu Province in the eastern part of DR Congo known as the Great Lake region, which borders on the country of Rwanda. These are among the most densely populated regions of the country. Much of the province is mountainous, and agriculture continues to be the primary source of income, with animal husbandry, particularly the raising of cattle and goats, critical to livelihoods. The dominant ethnic group is Shi, and languages spoken are Mashi/Kihavu and Swahili. From 1994 up to 2006, the area was seriously affected by a series of war and conflict, causing a mass influx of refugees to the area which contributed to the destruction of people's livelihoods and created much uncertainty and unrest. With recent peace in the area, residents are re-establishing traditional livelihoods. Gradually, local infrastructures including health systems are being rehabilitated.

2.1.2 Kolwezi District, Katanga

Kolwezi is in the mining center of Katanga Province. With the transfer of government run mines to the private sector, Kolwezi was experiencing major economic changes over the past years until the recent decline in the economy worldwide. However, even during the economic boom between 2007-2008 resulting from dramatically increased mining revenues, the majority of the local population continued to live in extreme poverty. With the dominance of the mining industry, agricultural development has been less of a priority, and most of the rural population rely on subsistence farming. Residents represent several different ethnic backgrounds, including the Basanga, Bayake, and Barumbu groups, and speak Swahili.

2.2 Study Design and Sampling

Qualitative research was carried out to identify determinants in the utilization of health facilities, including both barriers and facilitators, and to understand why these factors play a role in selection of health care. Topics explored included illness signs and symptoms and perceived severity, home remedies, careseeking, household decision-making related to treatment, constraints for careseeking, perceptions of available health care providers and their corresponding quality of care, expectations regarding drug therapy and the consequences of failure to get treatment, sources of information on diseases, and the influence of other family and community members on health care.

Data was collected among the following target populations: caregivers (mothers or other guardians of children under five), a variety of health practitioners including traditional healers, drug vendors and trained providers, and health administrators. In each health zone, two health areas were identified according to performance (high or low) related to utilization of curative care. Health registers in the care centers were examined to find recent child cases of malaria, diarrhea and ARI. Once we located the household and successfully carried out interviews with caregivers, we requested villagers to locate another child who had recently experienced the same disease but had not obtained care in health centers from trained providers. Following the same study guideline, interviews were carried out with primary caregivers of these children. In the same health areas we identified households where a child death had occurred within the last six months attributable to one of the three leading killers of young children. The study design included a mix of semi-structured and open-ended methods as follows:

- key informant interviews--key informants were identified during the course of the semi-structured interviews and included physicians in charge of health zones, nurses, community health workers, NGO partners, the South Kivu provincial medical inspector, and traditional practitioners. In most cases, key informants were interviewed more than once.
- freelisting exercises—a freelisting exercise was conducted with caregivers of children under five in each research zone to generate an inventory of the cultural domain of childhood illnesses and the associated terminology for describing these illnesses. Respondents were asked to list all childhood illnesses in the area, and probing techniques were used to gather associated signs and symptoms, seasonal variation, and perceptions regarding treatment. The procedures elicited a core set of childhood illnesses frequently mentioned by respondents, and a range of other illnesses of less importance to the community. Items that were mentioned first and more often are considered to have greater significance or salience in the framework of childhood illnesses.
- semi-structured interviews—semi-structured interviews were carried out with caregivers of children under five who had experienced malaria (fever), diarrhea (more than 3 stools per day) or ARI (fever and cough) in the past month. In each of the study health zones, purposive sampling was used to identify six respondents who utilized the health center facilities. Children with malaria, diarrhea or ARI who were not taken to a health facility were identified at the community level through community health workers, village chiefs or other community members accompanying the research team at the village level.
- observations and open-ended interviews—direct observations were carried out with health practitioners, including trained providers and chemists most commonly sought for treatment of the three illnesses, to assess the care provided and approach used when dealing with caregivers and patients. Other factors associated with quality of care such as waiting time, cost, and interaction with patients were observed. A structured observation form was used to record treatment practices and quality of care. Subsequent to the observations, interviews were conducted to clarify any questions raised during the interview.

- death audits/case narratives—in-depth interviews were conducted with mothers and other primary caregivers of children who had died due to malaria, diarrhea or pneumonia within the past six months. The goal was to interview two caregivers of children who had died from one of the principle illnesses under investigation in each of the four research zones. The case narratives were designed to identify illness danger signs and symptoms that trigger home management and careseeking, constraints to seeking prompt care, household decision making related to caring for the sick child, and perceptions and choice of local health practitioners.

Table 1 presents the methods employed and number of interviews carried out in each site.

Table 1. Research methods used in the study

Method	Katanga		South Kivu	
	Dilala	Kanzanzee	Nyangazi	Miti
Key Informant Interviews	5*		11#	
Freelisting	14	13	15	14
In-depth Interview Center				
malaria	2	2	2	2
diarrhea	2	3	2	2
toux	2	1	2	2
In-depth Interview non-Center				
malaria	2	-	2	2
diarrhea	2	1	2	2
toux	2	4	2	2
Death Audits				
malaria	3	3	3	3
diarrhea	-	2	1	3
toux	3	1	1	2
Observations	5	3	4	3
Interviews Health Workers	5	3	4	3
Group Discussions	-	1	2	1

* World Vision AXxes coordinator, 1 MCZ, 3 nurses

2 MCZ, 1 AXxes coordinator and 1 health coordinator for Catholic Relief Services, World Vision AXxes Coordinator, 1 provincial medical inspector, 4 nurses, 1 traditional practitioner

2.3 Training

Two researchers with backgrounds in the social sciences received extensive training on qualitative data collection, including approaches used when interacting with respondents, conducting open-ended questioning with an emphasis on probing, note taking, and writing up and expanding upon field notes prior to data collection. Emphasis was also placed on obtaining informed consent and ethical issues related to carrying out research.

Interview guidelines were developed by the primary researchers. Once the team arrived in the study sites, local members of the population were selected to serve as translators in the local languages. Translators received two days of training prior to data collection during which they were introduced to the interview methods and guidelines. After classroom exercises were carried out, the study team conducted interviews at the community level and experiences were shared with a focus on the respondents' understanding of the questions, language appropriateness, and the responses elicited. Modifications were made on the study instruments based on the results. After the training, additional pilot tests were conducted until the lead researcher was satisfied that the instruments were adequately fine-tuned.

2.4 Data Collection and Management

Interviews with caregivers were carried out in the ethnic or regional language, while key informant interviews were conducted in French. All attempts were made to administer interviews in a private setting, either in the household or the workplace of a health provider. The data collectors recorded detailed notes and expanded the information in the form of text on a word processor immediately after the interview was completed. Efforts were made to collect descriptions of signs and symptoms and corresponding careseeking behaviors from the onset of illness to the time of recovery or death. Each data collector maintained separate text files on Word and back up files were given to the team leader. Transcripts generated through the in-depth interviews were reviewed on an ongoing basis as the data was collected. This process allowed the researchers to modify the instruments if needed.

2.5 Analysis

Once data collection was complete, a coding system was developed, capturing the main research themes and concepts generated through the research. Coding was subsequently done on Word. Once compiled, content analysis was used to identify trends of key concepts in the coded data. Data triangulation was employed to identify only those concepts that could be validated through a combination of data sources, such as multiple interviews and key informants. The freelist data was entered and analyzed on Anthropac

2.6 Ethical Considerations

Ethical clearance was obtained from the Kinshasa School of Public Health Ethical Review Committee which follows international ethical standards to ensure confidentiality, anonymity, and informed consent. Informed verbal consent was carried out with all research participants and interviews were conducted only after informed consent was obtained.

III. SUMMARY OF RESULTS

3.1 Context

3.1.1 South Kivu

Most of the population living in rural South Kivu rely on farming. In the zones of Nyangezi and Miti Murhesa, the primary crops include sweet potato, beans, corn, cassava and banana. However, in both zones two deadly viruses affecting banana and cassava have been introduced; particularly in Nyangezi, a virus called Mosaic is devastating agricultural production, destroying entire cassava fields. While agricultural production and proximity to the provincial capital of Bukavu facilitates trade of produce from Miti Murhesa to Bukavu, in the more isolated zone of Nyangezi commerce is virtually non-existent. There, small commerce and local markets do not operate outside the central town, and even the large market only functions once a week. As a result, villagers have to travel long distances to sell and purchase even staple items.

In both sites in South Kivu, we uncovered a widespread belief that particular signs and symptoms detected in young children such as cough, fever, diarrhea and a refusal to eat is caused by a condition associated with the tonsils. This condition is perceived to be a very serious health problem that, according to our respondents, had touched in some way virtually all of the children from South Kivu included in the study.

The common way to address this health problem is to have the tonsils cleaned or cut when signs and symptoms associated with the condition appear. We also found that as a preventative measure to stop the tonsils from growing too big, caregivers frequently have their childrens' tonsils cut, often during the first month of the infant's life. Doctors working on the maternity ward explained that mothers of newborns often sneak out of the hospital at night to have the procedure done. Procedures are carried out by traditional practitioners, widely recognized and sought out for their expertise, who either use a stick to rub the tonsils with a substance (e.g. honey, medicinal plant, rock salt) or more commonly use scissors to make an incision. If an incision is made, alcohol or medicinal plants are applied to help the wound heal. We interviewed the most popular traditional practitioner in Nyangezi and this man indicated that he treats 15 to 20 children daily. Not surprisingly, trained health workers indicated that the traditional treatment frequently causes hemorrhaging or infection, as well as extreme pain and trauma for young children.

The majority of children in our sample had had their tonsils cut, sometimes on repeated occasions, with mothers commonly suggesting that the problem with the tonsils was the basis for many of the most frequent and deadly childhood illnesses. Correspondingly, several of the death cases from South Kivu had had their tonsils cut shortly before the death of the child. However, trained health workers were unwilling to recognize the condition, stating that it was an imaginary illness. As a result, the facility-based health workers developed a reputation for being unable to treat the local illness, and in cases when caregivers believed the local condition was the cause of the child's illness, the caregivers often bypassed the health centers or sought simultaneous treatment with the local practitioner because of the perception that the child's health condition was not properly addressed in the health center.

3.1.2 Katanga

The first zone, Dilala, is located in an urban and semi-urban setting in the mining district of Kolwezi. In Dilala, many residents work for mining or other industries operating in the area. At the time of the study, small businesses and commerce appeared to be bustling in both the more urban and semi-urban centers. In sharp contrast, people living in the second zone, the rural zone of Kanzenze, rely on subsistence farming, and even small commerce is non-existent. In one of our research sites, we found that during the cultivation season families shift their homes to more rural locations to be closer to their fields, where they reside for several months. This removes them from more densely populated areas and limits access to health facilities. Curiously, the cultivation of farming fields is carried out by individual family systems and is not done in cooperation with other partners. This approach appears to limit farming productivity.

3.2 Background on Respondents

3.2.1 South Kivu

Socioeconomic information presented in Table 2 highlights some differences between the urban and rural households studied. In South Kivu, respondents were living in the same community for an average of 24 years, with most residing in semi-permanent structures without electricity. The primary source of drinking water was from a well, and generally families slept on a mat. The majority of respondents indicated that they most frequently travel by foot.

While most interviews were conducted with the child's mother, we also interviewed fathers and grandmothers (see Table 3). Educational levels of childrens' mothers were very low, with 70 percent having no education. Although the vast majority of household heads were farmers, most had received some formal schooling. The average age of children under study was about 15 months, with 69 percent having received full vaccination coverage.

3.2.2 Katanga

Socioeconomic information from Katanga presented in Table 2 suggest that respondents had resided in the area for a shorter period of time and had a higher standard of living, with respondents more likely to live in a permanent household structure and to have access to electricity and pumped water. Over two thirds of respondents slept on a bed or mattress placed on the ground, and the majority used a bicycle for transport.

Katanga respondents were predominantly mothers, with approximately 75 percent having received a formal education. About half of the heads of households were farmers residing in the rural zone of Kanzenze. The others were involved in mining and industrial occupations, and about 15 percent were unemployed. Close to a third of family household heads had not attended school. The average age of the children selected for the study was 13 months and full vaccination coverage was 66 percent amongst the study children.

Table 2. Socioeconomic information collected on study households in South Kivu and Katanga

HOUSEHOLDS			
VARIABLES		KATANGA	SOUTH KIVU
NUMBER OF RESPONDENTS		35	35
NUMBER OF PEOPLE LIVING IN THE HOUSEHOLD		6.6 (ET 2,3)	7 (ET 2,8)
YEARS IN THE COMMUNITY		10.3 (ET 8)	23.9 (ET 13,8)
HOUSEHOLD	OWNER	77%	100%
TYPE OF CONSTRUCTION	CEMENT	32%	3%
	PARTIALLY MADE OF CEMENT	58%	81%
	MUD	10%	16%
ELECTRICITY	IN THE HOUSE	40%	21%
	FROM A NEIGHBOR	6%	0%
DRINKING WATER	WELL	49%	86%
	RIVER/LAKE	11%	3%
	PUMPED	20%	3%
	IMPROVED SOURCE	20%	9%
TYPE OF BED	BEDFRAME AND MATTRESS	27%	23%
	MATTRESS	41%	23%
	MAT	32%	54%
COOKING FUEL	WOOD	34%	97%
	CHARCOAL	54%	3%
	PORTABLE STOVE	11%	0%
SOURCE OF TRANSPORT	BY FOOT	20.6%	77%
	TAXI BUS	15%	6%
	BICYCLE	65%	3%
	MOTORCYCLE	0%	14%

Table 3. Background information collected on the child's mother, sick child and head of household from study respondents in South Kivu and Katanga

RESPONDENT			
VARIABLES		KATANGA	SOUTH KIVU
NUMBER		35	35
AVERAGE AGE		28	33
RELATION WITH THE CHILD	MOTHER	86%	66%
	GRANDMOTHER	3%	9%
	FATHER	6%	23%
	AUNT	0%	3%
MOTHER			
EDUCATIONAL LEVEL	NO EDUCATION	8 (n=30)	16(n=23)
	AVERAGE YEARS OF EDUCATION FOR THOSE WHO STUDIED	7 (SD 2.7)	7.7(SD 4)
CHILD			
VARIABLES		KATANGA	SOUTH KIVU
AVERAGE MONTHS OF AGE		13 (SD 10.7)	15 (SD 11.5)
VACCINATIONS	BCG	80%	85%
	DPT 3	66%	69%
	MEASLES	43%	54%
	POLIO	69%	69%
HOUSEHOLD HEAD			
VARIABLE		KATANGA	SOUTH KIVU
OCCUPATION	FARMER	50%	82%
	UNEMPLOYED	15%	3%
	MANUAL LABOR	9%	15%
	MINING	12%	0%
	FACTORY WORKER	15%	0%
EDUCATION	NUMBER WITHOUT EDUCATION	11	11
	AVERAGE YEARS OF EDUCATION FOR THOSE WHO STUDIED	9.2 (SD 2.7)	7.4 (SD 3)
RELIGION	CATHOLIC	6%	80%
	PROTESTANT	18%	14%
	OTHER CHRISTIANS	33%	3%

3.3 Freelisting results

3.3.1 South Kivu

In South Kivu, 29 respondents were interviewed and 47 different childhood illnesses were cited during the freelisting exercise eliciting, with 11 different terms identified to describe the condition that affects the tonsils and believed to kill young children (see Annex I for a description of each term). Table 2 shows that malaria is perceived to be the most important childhood illness, with diarrhea second, the condition that affects the tonsils third (in this case referred to as *cirimi*), and cough fourth.

3.3.2 Katanga

In the Katanga, 27 respondents were interviewed and 38 different childhood illnesses were cited during the freelisting exercise. Table 2 shows that cough is perceived to be the most important childhood illness, followed by malaria, diarrhea, and measles. Fever was cited separately and the results show it is considered the fifth most salient illness that affects children.

3.4 Health Systems

3.4.1 South Kivu

Both zones included in the study were changing from an emergency to a transition phase, which meant that consultation fees had recently gone from being free to a fee of 400 F to US \$1. While this transition suggests that the zones are transgressing to a development phase, the lack of economic revenue and general level of poverty raised many questions about the relevance of the indicators being used to determine when this transition should occur.

The first zone, Nyangezi, is comprised of 10 health areas and a reference hospital, with an overall population of 102,000. The zonal administrative office is located next to the reference hospital. Much of the population live in the mountains and travel to a health center can be arduous, requiring in some cases travel of over 10 kilometers or 1.5 to 2 hours to obtain health care. At the time of the study, Malteser (a German NGO) was also funding the zone, with their primary role involving the provision of salary bonuses to health workers.

Miti Murhesa is comprised of 16 functioning health centers and a population of approximately 166,000 inhabitants, with all villages within 6-7 kilometers of the health centers. The zone does not have a central administrative office or a reference hospital, but rather uses three private hospitals to which patients can be referred. Miti Murhesa borders on a health zone financed by International Rescue Committee (IRC), which offers free health care. As a result, residents may opt to travel to the neighboring zone to obtain free care, and this practice appears to impact on the utilization of the zone health centers to rates as low as 9%. Several other donors are working in Miti Murhesa, including Louvain Development, CMIBAC, CK40, and CPAC, offering a range of services including the construction and rehabilitation of health centers and hospitals and the provision of health materials and equipment.

Table 4. Results from freelisting exercise identifying perceptions of illnesses affecting young children

FREELISTING RESULTS

South Kivu					Katanga				
No	Illness	Frequency	Rank	Smith's saliency	No	Illness	Frequency	Rank	Smith's saliency
1	Malaria	26	3.5	.660	1	Cough	23	3.4	.591
2	Diarrhea	19	3.3	.490	2	Malaria	22	4.1	.524
3	Cirimi	19	5.6	.345	3	Diarrhea	24	4.7	.516
4	Cough	14	4.3	.318	4	Measles	17	4.1	.394
5	Civubo	18	5.7	.311	5	Fever	15	3.8	.373
6	Bronchitis	13	5.4	.235	6	Stomachache	11	4.5	.260
7	Measles	16	6.9	.210	7	Typhoid	11	4.9	.246
8	Kankoto	9	5.0	.190	8	Cold	11	5.0	.230
9	Kavuha	9	5.2	.186	9	Headache	11	6.1	.192
10	Angine	7	3.3	.179	10	Problem with spleen	7	4.0	.179
11	Headache	7	3.6	.169	11	Throat infection	7	5.6	.149
12	Worms	11	6.5	.150	12	Hemorrhoids	7	5.0	.149
13	Bigoga	6	4.3	.135	13	Chickenpox	7	5.4	.133
14	Cent Francs	8	6.5	.128	14	Convulsions	5	3.4	.130
15	Stomachache	5	4.4	.117	15	Tuberculosis	4	5.0	.091
16	Anemia	5	5.4	.095	16	Bronchitis	5	5.8	.082
17	Epilepsy	5	4.4	.087	17	Anemia	4	5.3	.069
18	Gale	5	6.2	.086	18	Hernia	4	6.0	.064
19	Amebia	3	3.3	.075	19	Worms	7	7.5	.062
20	Kanzanza	4	5.8	.071	20	Polio	2	4.5	.051
21	Cirato	3	5.0	.066	21	Scabies	3	7.3	.046
22	Cold	3	4.3	.060	22	Musamvu	2	4.5	.043
23	Caminyagu	2	2.5	.060	23	Yellow fever	4	8.2	.038
24	Flu	4	6.5	.059	24	Ringworm	2	7.5	.034
25	Ngonga	3	7.0	.051	25	Earache	2	7.0	.031
26	Polio	5	7.8	.041	26	Kasumbi	2	6.5	.030
27	Varicelle	3	6.7	.041	27	Dehydration	2	7.5	.021
28	Dermatose	2	5.5	.041	28	Smallpox	1	6.0	.020
29	Rate	2	5.5	.039	29	Conjunctivitis	3	10.6	.019
30	Sindagiza	2	5.0	.039	30	Vomiting	1	5.0	.016
31	Fever	1	1.0	.034	31	Cholera	2	9.0	.015
32	Fontanel	2	4.5	.032	32	Amebas	1	6.0	.014
33	Vomitting	1	2.0	.032	33	Achy bones	1	6.0	.014
46	Convulsions	3	8.0	.030	34	Flu	1	8.0	.013
34	Kamishi	1	2.0	.030	35	Skin fungus	1	10.0	.013
35	Lusingo	1	3.0	.028	36	Whooping cough	2	8.5	.012
36	Malnutrition	2	7.0	.025	37	Fontanel	2	9.5	.012
37	Distended stomach	2	7.0	.024	38	Cry a lot	1	8.0	.005
38	Nyandazi	2	9.0	.022					
39	Teignes	2	5.5	.021					
40	Kwashiorkor	2	7.0	.019					
41	Izuba	1	7.0	.017					
42	Budorhola	1	7.0	.016					
43	Conjunctivitis	3	10.7	.010					
44	Hemorriods	2	9.5	.007					
45	Lukunga	1	9.0	.007					
46	Meningitis	1	11.0	.006					
47	Asthma	1	9.0	.004					

3.4.2 Katanga

The zone of Dilala has a wide range of health services offered by both the government and the mining industry, as well as private clinics and health facilities operated by religious groups. Pharmacies of different sizes are also functioning throughout the city of Kolwezi. Those working in the mining and other industries are given free health coverage. The zone has a population of 103,000 and 10 health centers, and the zone administrative office and reference hospital are situated in adjacent concessions in Dilala.

The second zone, Kanzenze, encompasses a rural, agriculture area with a population of 106,000 and 12 health centers, some of which are located as far as 195 km. from the zone headquarters. Many of the health centers are private but integrated into the zone system. This is problematic because the owners of the health centers frequently change their personnel without informing the MCZ, and the government cannot control the way the health centers are operated. The central office and reference hospital are located in different locations, which results in a lack of coordination between the doctors working as clinicians and administrators and decreases access to the reference hospital.

3.5 Médecin Chef de Zone

3.5.1 South Kivu

In both zones where we carried out research, the MCZ lived with their families far from the central office and were clearly absent from their post most of the week. While the head physicians cited poor security, lack of good schooling for children, and the fact that their spouses have a job elsewhere as the reason for their unwillingness to reside in the zone, in both cases the MCZ appeared to be engaged in other work that allowed each to generate an income. They also spent time in the provincial capital attending meetings and workshops for which they collected per diem. Their absences clearly impacted on the daily functioning of the zone, affecting monitoring and supervisory visits to health centers, which were often being carried out by less qualified personnel, and diminishing their overall understanding of the needs and operation of zone activities. Both MCZ appeared to use the office vehicle for their personnel needs, lacked good management skills and generally were not accountable to anybody. While the Medical Inspector of South Kivu recognized the problem, instituting a system whereby the MCZ must request permission from the Territory Leader to travel outside the zone, the MCZs continued to function relatively independently.

3.5.2 Katanga

In Dilala, the MCZ was never in her office and refused to respond to our phone calls. Over time, our team realized that she was simply unwilling to meet with us. In reality, she appeared to be primarily occupied in her job as Medical Director of the Gecamine (mining) hospital.

The MCZ of Kanzenze only spent three days a week in the zone office, explaining that there was no lodging provided for him and his family, and he therefore was forced to commute from Kolwezi. The other days of the week he suggested that he carried out supervision in zones closer to Kolwezi; however, we learned that he was also working as a clinician in other health facilities. Despite the fact that his time in the zone headquarters was limited, his knowledge of the zone

structure, operations and difficulties faced was very impressive. The MCZ of Kanzenze indicated that his biggest challenge is carrying out supervisions, and that the distance and the poor state of the roads prevented him from reaching all the health centers on a regular basis.

3.6 Nurses

3.6.1 South Kivu

Nurses in these zones, particularly in Nyangezi, work in extremely isolated conditions. Lack of regular supervision often means that they have contact with the central administrative staff only once a month, when they are requested to convene in the zone headquarters for a meeting. Conditions in the health centers are far from exemplary (e.g. offices failed to open on time, medicines were sometimes stored on the ground, conditions were frequently unclean), providing evidence of some of the effects of inadequate supervision. Nurses described supervisory visits as infrequent and superficial, with supervision generally carried out in response to a problem and the extent of the supervision often entailing a cursory review of documents in the health center.

The training of the nursing staff working in health centers was mixed, with most having a level of A2, which is equivalent to five years of schooling after primary school. The vast majority of nurses interviewed were not formally recognized by the government, and as a result, they were officially receiving only \$7 per month. When asked about the biggest obstacles faced at work, the consistent answer was lack of motivation because they were not paid adequately and regularly whether or not they were officially recognized by the government. Some expressed resentment, suggesting that although they were originally from the local area, they were not included as beneficiaries in assistance programs. They suggested that both health workers and the local population should benefit from aide projects and admitted that the desperate conditions under which they work forced them to steal medications simply in order to survive. When talking about AXxes, one nurse explained,

Presently we are receiving a lot of medicines, but we are not being paid. This encourages us to steal the medicines. The project needs to consider how everybody can benefit.

Difficult work conditions result in high staff turnover, and once nurses receive additional training, they often seek out better paying employment in larger cities.

Other work challenges included the state of the health centers, particularly in Miti Murhesa where some centers were situated in rented homes made of mud; added to this was the lack of equipment (for instance, laboratory equipment to carry out proper diagnoses), insufficient medical supplies, lack of living quarters for the nurses where travel to and from home was not feasible, and forced separation from their families.

3.6.2 Katanga

Most of the nurses in Dilala had received the highest level of nursing training. However, in the rural zone of Kanzenze the nurses were frequently under-qualified, with most having concentrated on another subject (e.g. agronomy, biology) through high school, and later choosing to go through government training for several months to become nurses. The vast majority of the nurses working for the government were not on the official government payroll and were therefore only receiving a very small monthly salary in addition to a percentage they got from services they provide in the health centers. Even those on the government payroll were not being paid the monthly bonus owed to them. We also found that many of the nurses recently trained through the AXxes project were opting to leave the rural settings for a better paying job in Kolwezi. The program director of World Vision explained that nurses in the rural area earn about 2,000 to 3,000 F per month; once they receive additional training, they seek out work in health facilities in Kolwezi where they can earn 20,000 to 25,000 F on a monthly basis.

While the health centers in the semi-urban centers of Dilala were generally better equipped and situated in renovated buildings, the rural facilities once again lacked basic equipment and conditions were often disorderly or even dirty.

3.7 Treatment Approaches

3.7.1 South Kivu

In South Kivu we found a range of consultation fees (400-800 F), particularly in Nyangezi where the zone is presently introducing higher fees. However, the population does not appear to be informed about the reason for the higher fees and costs involved as zones gradually transition to a development phase. Many of our respondents indicated that they no longer use health facilities due to the change in price. While all the nurses interviewed acknowledged local poverty and the need to treat patients on a credit basis, they indicated that this can cause great difficulty, leaving them often unable to recover debts which may represent hundreds of thousands of Congolese francs. As a result, the willingness to accept payment on credit appears to be changing, with many health workers refusing seriously sick cases who already had a debt or those who could not pay for treatment.

Approaches to medical treatment varied. In the mountainous zone, nurses frequently took into account the distance caregivers needed to travel, often requesting caregivers to return after several days for follow-up. Health workers infrequently used injections and intravenous drugs for treatment.

3.7.2 Katanga

The price for treatment in the zones of Dilala and Kanzenze was both expensive and variable, with the health cards ranging from 100-400 franc, consultation fees 1000-4000 franc, treatment 1800-5000 franc, and costs for laboratory 1200-3000 franc. The high costs can in part be explained by the frequent use of injections and intravenous drugs. Those residents who worked for a local company had health care coverage and therefore were only required to pay for the health card.

In the rural areas, nurses insisted that caregivers of sick children must travel to the health center each day for treatment, suggesting that mothers were unable to follow treatment regimens at home. This meant that some caregivers had to travel long distances of up to 12 kilometers in each direction carrying a sick child. Over time, we realized that this system is used to ensnare the client and assure that payment is made at the end of the treatment. During the seven day treatment period, families are given adequate time to borrow money or cut down trees and burn wood to produce charcoal to pay for the treatment. Personnel working in one health center were willing to treat patients on credit; food such as manioc, maize or chicken or material items such as local cloth or shoes were accepted as a sort of collateral to guarantee payment. However, over a five year period, the population had accumulated debts of over 500,000 franc in this facility.

3.8 Provider/Caregiver Interactions

3.8.1 South Kivu

Respondents indicated that communication between the health worker and caretaker was generally extremely limited, with the health worker typically requesting little information regarding the illness episode and providing minimal explanation related to the illness and treatment. One nurse indicated that the nurses intentionally minimize the exchange of information as a means to limit the knowledge of caregivers which would allow them in the future to go directly to the pharmacy for treatment, bypassing the health center. This minimal interaction results in the caretaker leaving the health center with little understanding of the cause and ways to prevent the condition in the future, and lack of communication sometimes results in the caretaker having a different understanding of what the child suffers from. We also uncovered an unwillingness of health workers to recognize local belief systems that often guide careseeking. As a result, caregivers often leave the health center feeling that the child's health condition has not been addressed. Caregivers also get criticized or threatened if they talk about local practitioners such as traditional healers, Red Cross agents, or pharmacists, and as a result they are reluctant to reveal previous visits or medications administered during the same illness episode. Overall, there was no counseling on liquid and food intake for the sick child.

Observations were carried out over a period of 2.5 to 4 hours in health centers to assess the quality of care (see Table 5). Interestingly, the findings generated from our in-depth interviews with caregivers did not correspond with the results from observations, which suggest that in two thirds or more of cases health workers were conducting a thorough examination of sick children, explaining the treatment and encouraging mothers to ask questions. The findings from the observations suggest that only slightly over 50% of health workers were explaining the condition to the caretaker, and in Nyangezi the time caregivers had to wait before receiving treatment was at times extremely lengthy, averaging almost four hours in one health center.

3.8.2 Katanga

The data collected through in-depth interviews once again suggest that communication between the health care providers and caregivers was very poor, involving minimal interactions concerning the illness episode and recommended treatment. In addition, even when interactions occurred, we found that the health staff had a tendency to use technical language and terms that were incomprehensible to the often uneducated caregivers or even to communicate in French so that the caretaker could not understand. The result was that, even after spending weeks in a hospital with a sick child, the caretaker was frequently unable to identify the cause and ways in the future to prevent the illness. Once again, there was no counseling on liquid and food intake. On several occasions we found the illness registered in the health center was different from that in the child's health card, further underscoring a general lack of interest by the health workers in their work and the administration of treatment.

Particularly in hospital settings, we found health workers to be very intolerant and sometimes cruel, often unwilling to interact with caregivers or reprimanding them if they ask questions. When one mother inquired about her child's condition, the nurse said,

What are you after? We are the doctors and we do our work, what do you know?
(Mother of child who had died of malaria, Dilala)

On several instances we found that health workers were slow in responding to emergency situations, with data suggesting that first securing money was the primary concern.

Results from the observations of health workers were once again relatively positive, with the data suggesting that the vast majority of health workers do an examination of the sick child and explain the condition and treatment to the mother. However, in Dilala only about half of the caregivers requested information, and in Kanzenze virtually no mothers posed questions to the health workers. Waiting time for treatment in Dilala averaged 45 minutes, while due to the low patient load, in Kanzenze there was virtually no wait to receive treatment.

HEALTH ZONE	Health Facility	Number of sick cases	Female Cases	Average	Place to sit (%)	Average waiting time (minutes)	Greeted caretaker (%)	Did a physical exam (%)	Explained diagnosis (%)	Explained treatment (%)	Caretaker asked the provider questions (%)	Average price	Time carried out observations
DILALA	HOPITAL	10	7	15	100	42	100	100	100	100	80		195
	KAWAYIDA	1	1	10	100	13	100	100	100	100	0	\$1,30	150
	METHODIST	10	4	23,6	100	29	10	100	100	100	60		287
	SAINT LUC	9	6	9,8	78	94	33	89	44	78	33	\$3,70	240
	UZIMA	1	1	0,0	100	0	100	100	100	100		\$1,00	180
	Total	37	19	15,6	94	45	52	97	84	94	55	\$0,32	1052
KANZENZE	KAMOA	4	3	15,0	100	1	100	100	100	100	0	\$2,60	180
	NZILO	1	1	10,0	100	10	100	100	100	100	100	\$2,30	180
	WALEMBA	3	1	21,3	100	4	100	100	100	33	0	\$5,23	198
	Total	8	5	16,8	100	3	100	100	100	75	13	\$3,55	558
MITI	KALWA	8	6	16,8	100		100	100	100	100	100	\$1,00	190
	KASHUSHA	2	1	30,1	100		100	100	100	100	50	\$0,50	190
	KAVUMU	9	2	23,2	100	10	67	100	100	100	100	\$1,00	190
	Total	19	9	21,2	100	10	84	100	100	100	95	\$0,95	570
NYANGEZI	IBAMBIRO	6	4	13,8	100	225	83	83	33	100	33	\$0,61	90
	MUZINZI	15	9	33,1	100	102	40	47	47	93	67	\$8,25	135
	ST VINCENT	6	3	44,3	100	13	100	100	100	100	100	\$1,67	180
	Total	21	16	31,3	100	109	63	67	56	96	67	\$5,28	405
TOTAL	Total	85	49	22,0	98	62	67	88	80	94	64	\$3,39	2585

3.9 Medications

3.9.1 South Kivu

In South Kivu, medications are stored in a warehouse operated by BDOM (Bureau Diocésin des Oeuvres Médicales), and a charge of 7% is required for each medical shipment. Once in the warehouse the medications are not always easy to access, causing delays in medical stocks reaching the health zones. During the research period in Miti Murhesa we found that the medical supplies were several months late in arriving, and as a result the health workers were unable to follow standardized treatment in the centers, necessitating the purchase of other drugs on the market, which in turn resulted in an increase of price. In this setting, caregivers often complained that the medication administered to their children was of poor quality, forcing them to opt to purchase medications elsewhere, and lowering their perceptions of the quality of services offered in the health centers.

3.9.2 Katanga

In Katanga, the NGO partner stored AXxes medications in their own warehouses, allowing them to have greater control over the delivery of medicines and preventing shortages in health centers. Health providers repeatedly praised the quality of the AXxes medications, indicating that they preferred using them over other drugs. However, in health centers where clientele varied according to their economic and work status, there was no mechanism to separate drugs according to the client's designated coverage. As a result, AXxes medications were being used to treat families who were normally covered under a health program offered by the mining or other industries, and we suspected that wealthier clients may have even been favoured and therefore were more likely to receive the more effective AXxes drugs.

3.10 Community-based Approach

3.10.1 South Kivu

In South Kivu we uncovered a strong community-based infrastructure, which included the health committee (CODSA) and community health workers, and the active involvement of village chiefs. While the initial concept entailed that community health workers inform members of 15 households about illness prevention and treatment and the importance of vaccinations, their role has expanded and now involves many other tasks including promoting family planning, distributing vitamin A capsules, carrying out well baby weighings for children over 12 months, informing the population about malnutrition and collecting debts accumulated in health centers. Over 40 percent of community health workers in South Kivu were women, which may in part explain the sustainability of the community health work force. According to Catholic Relief Services (CRS) staff, women are more willing to devote time to community activities even if there is little financial compensation; this at present involves receipt of 10 percent of client fees and a small compensation during vaccination campaigns. Moreover, much of the health information (e.g. breastfeeding, family planning, HIV, etc.) they are required to disseminate is

more appropriately conveyed by a woman. In South Kivu we were told that it is perceived to be a privilege to serve as a community health worker.

Obstacles to carrying out their work included misconceptions by community members about their role and motivation, the number of households they were expected to follow, and lack of compensation. Ways suggested to increase their motivation included health coverage for their families, provision of transport in the form of bicycles, availability of micro-finance projects, and an increase of their visibility and recognition in the community through the receipt of hats, tee shirts, and stickers.

3.10.2 Katanga

In Dilala, there was no functioning community-based approach. In the rural zone of Kanzenze, one health center worked with a core group of community health workers and the other did not. However, in the setting where the community health workers existed, they were not attached to the traditional village infrastructure and appeared to function in a somewhat isolated fashion, mostly acting as a liaison between the health center and the villagers. All of the workers in this area were male, and their role involved providing health lessons on the importance of obtaining vaccinations and treatment for illnesses in the health centers to families living in 15 households. When asked what motivates them to work as volunteers, they indicated the following: a reduction in treatment costs at the health center; the small percentage (30%) they receive for selling mosquito nets and distributing vitamin A; the training they receive; and the opportunity to assist the local population. Suggestions for additional motivations included providing a moto or bicycle, free treatment, t-shirts or caps to increase their visibility, and soap. While AXxes envisioned the distribution of mosquito nets as a means to motivate community health workers, we found that the community health workers in this zone had only received 29 nets.

3.11 Careseeking Behavior

A detailed description of the information collected is presented in Annex II-VII.

3.11.1 Malaria

a. Health Center

The data revealed that caregivers in both sites were very fearful of malaria and fever, with many indicating that they had lost other children due to the disease. While home remedies generally focused on reducing fever and included giving paracetamol, aspirine or a cold bath, about half of the respondents did not attempt therapy at home, preferring to seek trained care rapidly due to the perceived seriousness of the child's condition. Correspondingly, compared to the other illnesses, caregivers spent fewer days at home, averaging two days in the household before seeking care. In each case, the first careseeking episode was with a trained provider in the health center. In both sites, respondents cited a variety of causal explanations, ranging from exposure to a cold environment, drinking bad water, poverty, or a poor diet, with only two of nine respondents suggesting that the disease is transmitted through mosquitoes or insects. This is despite the direct contact the caregivers had had within the past month with health agents, which

averaged six days of daily treatment for the young child. Correspondingly, in the few households where we found mosquito nets, the nets were not being used as designed. Rather, they were used as curtains or as stuffing for a mattress. Even if families understood their purpose, the size of the bedroom and low ceiling frequently prevented families from hanging the nets properly.

In South Kivu, caregivers frequently associated fever with the local condition associated with the tonsils, with two caregivers opting to have the tonsils cut by the traditional practitioner. In one case the mother discontinued treatment with the trained providers, believing that after receiving care the child's condition was not improving, while the second caretaker chose to pursue traditional and modern treatment simultaneously. Both mothers indicated dissatisfaction with the fact that tonsils weren't taken into consideration during the health care treatment, believing that the child could only be fully cured if they visited the traditional practitioner. In the zone of Miti Murhesa, two of five care providers indicated that they were dissatisfied with treatment in the health center, asserting that the medication was ineffective, thus forcing them to seek alternative care.

We see two major differences between the two sites; the first relates to the number of careseeking episodes. In Katanga caregivers sought care only with trained providers, whereas in South Kivu half of the respondents opted to seek additional care either with the traditional practitioner or pharmacist. Another difference relates to the cost of care, which was significantly higher in the district of Kolwezi. Despite the fact that costs were lower, obstacles to seeking care in South Kivu still more often related to lack of money, highlighting the extremely poor economic situation of people in the districts under study. Other obstacles to careseeking related to the poor quality of care in the health centers, with respondents highlighting the failure of health personnel to make a proper diagnosis, the ineffectiveness of medicines and the inconvenience of health center hours.

b. Choosing alternatives to a health center

All of the six respondents interviewed indicated that the fever afflicting the child indicated that the condition was malaria. Respondents interviewed said they were not concerned about the illness episode, suggesting that the signs and symptoms suggested the condition would quickly pass without the need for trained health care. Once again we see a range of causal explanations, with half of the respondents indicating they did not know the origin of malaria; other interpretations included the condition was linked to mosquitoes, bad blood and a cold environment. The majority of respondents opted to administer allopathic drugs at home that they believed would treat the fever. In Katanga, medications were purchased from a local pharmacy, while in South Kivu they were obtained from a friend. In South Kivu, respondents indicated that money and the concern of being transferred to a hospital were the biggest obstacles to seeking care, with many highlighting the recent refusal to accept credit and the increase in consultation fees as major barriers. In Katanga lack of money, the convenience of administering medication at home, and the long wait for care were cited as constraints to going to the health center.

3.11.2 Acute Respiratory Infection

a. Health Center

In both sites, we found little understanding among caregivers regarding respiratory infections and associated signs and symptoms. While caregivers indicated that they expected children to have frequent bouts of cough, they did not link cough with fever, but rather viewed and treated them as separate illnesses, with fever often believed to be related to malaria. Correspondingly, caregivers were unaware of the term pneumonia, and there was no local term to identify pneumonia in either site. Causal explanations for the illness episode were once again varied, with the most frequent responses including the cold environment or supernatural sources or they didn't know.

Home remedies involved both allopathic medicines purchased at a pharmacy and food therapies, and careseeking was only carried out after spending on average three days at home, with the onset of difficult or rapid breathing often causing concern and provoking caregivers to seek trained care because the illness was then perceived to be very complicated, with the child believed to be suffering from several diseases at once. Treatment in all six cases was only sought in the health centers and often involved more invasive procedures in the form of injections, with treatment costs once again being significantly higher in Katanga. All caregivers were satisfied that the condition was properly treated at the health center and additional careseeking was not pursued. The most commonly named barrier to obtaining professional care in South Kivu was money, while in Katanga deterrents mentioned the ability to purchase medication and treat at home, money, and in the rural zone where the caretaker had to carry the child seven kilometres each way to receive treatment, distance to the health center.

b. Choosing alternatives to a health center

Those cases who did not seek care with trained providers working in the health centers were frequently treated at home with medicines purchased to treat cough or reduce fever; a few respondents indicated that no home treatment was administered, and in the rural site of Katanga, medicinal plants were applied. In South Kivu, half of the respondents sought care outside the household with one going to the Red Cross agent located in the same village, explaining that the health center was far away, requiring one and a half hours travel time, and the Red Cross agent was equipped to treat childhood illnesses. Another caretaker believed the condition stemmed from the tonsils, which needed to be cut, and that the traditional practitioner was the most appropriate health provider to treat the condition. Aside from those who sought medications from a pharmacist, only one in six caregivers in Katanga sought care outside the household, first from a Red Cross agent and subsequently from a traditional practitioner who could treat once again what was perceived as a problem with the throat. We again see a diverse range of perceived causes associated with cough and fever, including the cold environment, mosquitoes, evil spirits, the local condition relating to the throat and in some cases the respondents said they didn't know.

In South Kivu, the most common obstacle to seeking care in the health center was distance. Respondents also indicated that it was easier and just as effective to purchase medicines at the local pharmacy or that the disease was more appropriately treated by the local practitioner who

cuts the tonsils. In Katanga, obstacles to seeking care with a trained provider were varied, including a belief that the child's illness could not be treated with modern medicine, the conviction that it was easier and less costly to purchase and administer treatment at home, the bad behaviour of the health workers, the distance to the health center, particularly if the child had to follow treatment for several days, the family's debt at the health center, and lack of money.

3.11.3 Diarrhea

a. Health Center

Respondents also expressed much anxiety about diarrhea in young children, particularly citing continued stool output, vomiting and weakness as signs that the child's condition is very serious. We uncovered many types of diarrhea, which respondents felt required different treatments. Causal interpretations included the child's ingestion of something dirty or unhygienic, evil spirits or the respondent didn't know. While home remedies were mixed in South Kivu, involving no remedies, allopathic medicines, or tea, in Katanga respondents either applied ORT, which is believed to restore energy and stop diarrhea, or, in the rural area, medicinal plants. Only people in the semi- and urban area of Katanga consistently knew about and applied ORT; however, utilization appeared to be insufficient, usually involving the administration of one packet. Medicinal plants were used to purge the illness/dirt, stop the diarrhea and revive the child's appetite. One mother explained,

I first gave a medicinal plant at home to stop the diarrhea. Only when the diarrhea persists do I think of going to the health center. I don't go directly to the health center due to the distance and the cost. It doesn't make sense to leave work and household activities to go spend money in the health center for a sickness that can be treated at home. This is why I prefer to start with plants I know can be used as home remedies. If the situation gets more complicated, I can then go to the health center.

Careseeking in both sites occurred on average after two days of the onset of illness. The first line of careseeking was with the health care provider, with the exception of one case in South Kivu who first sought care with a traditional practitioner because the caretaker thought the condition was linked to the tonsils. In this case, the caretaker was dissatisfied because the tonsils were not cut, and subsequently went to a Red Cross agent also known to cut the tonsils. Because the diarrhea continued, the child was taken to a health center and eventually was sent to the reference hospital. A second case in South Kivu sought care with the traditional healer after having been treated in the health center for seven days; the caretaker explained that the medication prescribed was inappropriate and the illness signs such as weakness and persistent diarrhea suggested that the child needed to have the tonsils cut. Only one caretaker in Katanga sought care in more than one location; in this case, the diarrhea continued after receiving treatment in a health center, and the family subsequently traveled 11 kilometers to another facility.

Differences in treatment costs were once again large, with caregivers in south Kivu paying no more than 1200 francs for care. In comparison, cost for treatment in Katanga ranged from 2750 francs to 17,500 francs. The high price reflects the mix of medications typically prescribed,

involving intravenous drugs and injections. ORS was rarely prescribed in the health center, and there was no counseling on food and liquid intake.

Reasons for seeking care with the trained providers most commonly included the perceived severity of the child's condition, belief that the health workers could treat the condition, and in South Kivu, the fact they treat on credit. In South Kivu, we once again see that illness beliefs and appropriate treatment were the biggest constraint to seeking trained health care. In Katanga, those living in the urban center indicated that there were no obstacles, while the rural residents consistently mentioned distance as the biggest barrier, with caregivers there having to travel with the sick child on average eight kilometers a day each way over seven days to get treatment. In one case, the husband's absence at the onset of illness delayed careseeking.

b. Choosing not to go to a health center

Three respondents were identified in each site. The majority of caregivers gave home remedies in the form of antibiotics, stating that they could administer medications at home to reduce diarrhea that were effective and less expensive than seeking care in a health center. While we probed for feeding, there was no indication that respondents understood the importance of administering liquids and semi-solids during diarrhea episodes. Other treatments involved traditional medicine and ORS, with both known to reduce diarrhea. Causal explanations included evil spirits, the child's reaction to a food, worms, and some said they did not know the reason.

After seven days of home treatment, one child from South Kivu was taken to a Red Cross agent because the diarrhea persisted, the caretaker stating that she had a debt at the health center and therefore was not eligible for treatment, and maintaining also that the Red Cross agent was less expensive and administered effective medicine. In Katanga also, one of three children were taken for outside care; in this case, the child was believed to be affected by evil spirits, and the caretaker took the child to a pastor to pray. The most common deterrent to seeking care in the health center was the belief that there were effective medications available to apply at home that were less expensive, thus saving the time and cost involved in going to the health center. Distance to the health center, cost and the debt owed to the health center were also mentioned as barriers to obtaining care in the health center. One caretaker in Katanga indicated that her husband was absent, thus limiting her possibilities to seek care in the health center.

3.12 Perceptions of Vaccinations

3.12.1 South Kivu

Respondents indicated that vaccinations are believed to protect children against certain illnesses or reduce the symptoms if the child gets sick and were generally highly valued. Caregivers added that the problems associated with vaccinations are few; stating that they are free and offered regularly in the health centers, with most respondents indicating that they are informed in advance about vaccination days in the health centers. Failure to vaccinate children was attributed to ignorance, negligence or laziness on the part of the primary caretaker. We were also reminded that those unwilling to take their children to the health center can have their children vaccinated when campaigns are carried out in villages. Factors cited that could disrupt the

vaccination schedule are the illness of the child on the day of vaccinations, or the frequent moves and changing locations of the family.

In Miti Murhesa, several children had not been completely vaccinated due, according to the mothers, to a shortage of vaccines in the health centers. Some caregivers from Miti Murhesa also expressed concerns about the purpose of vaccinations, citing beliefs that vaccines paralyze children or are sent by white people to cause infertility or kill children and decrease the population.

In comparison, when asked hypothetically about barriers to accessing curative care in the health centers many obstacles were cited, including travelling long distances to the health center, time involved in seeking care, which some added reduces their work time in the fields, and money. Other obstacles included concerns that the health center might not have medication or that the child would be transferred to a reference hospital far away and costly. It was explained that in order to save time and money, some mothers have confidence treating on their own, preferring to buy medications they can administer at home. Some also admitted that traditional medicine can be a better option, as nurses do not know how to cure certain illnesses, which are more appropriately managed through traditional remedies or by local practitioners. In addition, negative rumours, such as allegations that health workers kill children, frequently circulate, deterring caregivers from seeking care in the health centers.

3.12.2 Katanga

Respondents agreed that vaccinations protect children against certain illnesses, and contended that even if the child gets sick, the illness episode will be less severe. Some respondents mentioned that vaccinations help children grow well. Respondents highlighted that because vaccinations do not require payment and are periodically administered in the village setting, they are easily accessible. While respondents appreciated the importance of vaccinations, they also mentioned that traditional beliefs or negative rumours can dissuade people, and some indicated that local leaders can have a bad influence by spreading negative information about vaccinations.

When asked hypothetical questions about careseeking, distance to the health center was highlighted as a major deterrent to obtaining curative care, particularly when the trip involves travelling by foot over long distances in rural settings. In addition, respondents mentioned that careseeking requires time and money. Some caregivers also cited obstacles related to the quality of care, faulting medications seen as ineffective as well as the indifference and even hostile behaviour of the health workers. It was also mentioned that beliefs about the illness and appropriate treatment may favour traditional treatment or medicinal remedies and prohibit careseeking with trained providers. Some stressed that it is not necessary to go to the center if the illness is not considered serious and treatment can be administered at home. One mother explained,

For fever, you can get traditional medicine or tablets to treat at home, and I will not need to go to the health center. But vaccinations are like an obligation, protecting children a long time against all illnesses.

Other factors mentioned included the disinterest or lassitude of the caretaker, the assumption that the illness would pass and a family debt at the health center.

3.13 Death Cases

3.13.1 Malaria

The vast majority of cases believed that the child had died of malaria. However, despite the prolonged contact many respondents had with trained providers, sometimes lasting more than 10 days, we once again elicited a wide range of causal explanations, ranging from the local belief relating to the throat, evil spirits, the consumption of bad water, stagnant water where mosquitoes breed, poison, and the disease having been transferred in the womb; in Katanga, half of the respondents were unable to name a cause. Home remedies were administered to all of the children in South Kivu, once again involving efforts to reduce the fever; in one case, the caretaker was convinced the child had been poisoned and administered a medicinal plant that would act as a purgative. In contrast, Katanga caregivers in the more urban site did not apply home remedies, while respondents from the rural areas administered medicinal plants or allopathic medications aimed to reduce fever.

Eight of the ten children who had died of malaria were taken to a health center on average one to two days after the onset of illness; two cases from South Kivu chose not to see a trained provider due to the causal interpretation and illness signs and symptoms. In one instance, the child was believed to be poisoned and in the second, the caretaker thought the tonsils needed to be cut. Reasons for seeking care with trained providers generally involved the perceived seriousness of the child's condition, particularly the persistent fever, and the vulnerability of the young child. Typically, children were first taken to one, and sometimes two, health centers where they were either refused for treatment due to lack of sufficient medicines or equipment or were treated as outpatients. The condition of those who were treated as outpatients typically worsened before being referred to a hospital or the parents decided on their own to seek hospital care. Travel to the hospital from rural sites could be extremely lengthy and time consuming, particularly from rural Katanga where sick children were transported by bicycle anywhere from 20 to 38 kilometers to obtain care. In one case, the child died during the long trip by bicycle. The delay caused during these initial visits to health centers and the conditions in which they were transported and travel time to the hospital may in part have contributed to the fact that all but one child who reached the hospital eventually died during hospitalization.

Paradoxically, the data show evidence that in many cases the trained providers also contributed to the child's death. For instance, in one instance the nurse in the reference hospital was drunk and gave the child the wrong blood type when performing a blood transfusion. We also uncovered cases where, upon arrival at the hospital, there was a long delay (in one case six hours), or health workers categorically refused to treat until the requested payment was produced. In these cases, the children died shortly after treatment was eventually administered, or the caretaker decided to return home where the child immediately died. Correspondingly, reasons given for the child's death mentioned in the Kolwezi district were commonly related to poor quality of care, with respondents citing the lack of competence of the trained providers and the lack of appropriate medications available, and many complained about the inappropriate

behaviour of the health personnel, who we were told were abrasive and uncaring, often showing a lack of respect towards the caretaker and disinterest in the welfare of the sick child. This father said,

I could never take a sick child there again. I'll never forget that day throughout my life, to see how the nurse and the doctor made fun of and played with the life of my son. (Father of son who had died of malaria, Kanzenze)

In South Kivu, illness beliefs appeared to be the biggest barrier to obtaining trained care, with two caregivers believing that modern medicine was not the appropriate treatment; in a third case, after receiving care in the health center and hospital setting, the mother concluded that modern medicine was ineffective and opted to have her child's tonsils cut. The child died one week later. In two cases, the husband's absence also posed a problem, hampering the mother's ability to make a quick decision to seek care.

In both sites, distance to the health centers frequently presented an obstacle to seeking care, with the mountainous terrain in Nyangazi making it difficult to transport a sick child and the long travel to health centers (7-9 kilometers) and hospital settings (20-38 kilometers), posing great challenges in rural Katanga. Interestingly, when malaria was suspected money was less frequently mentioned, despite the often high expenses incurred, reaching as much as \$65 in South Kivu and 50,000 francs in Katanga.

3.13.2 Acute Respiratory Infections

All of the caregivers of children who had died of ARI stressed that as the condition progressed the child manifested what was perceived as other illnesses such as difficult breathing or fever. This tendency to compartmentalize different illness signs and symptoms and failure to link cough and fever once again underscores the lack of recognition and understanding of ARI and corresponding treatment, even after the caretaker had a prolonged exposure to health workers during the child's treatment. When asked why the child died, this mother of a child who had received trained health care for approximately two weeks said,

I have no idea. Only the nurses know. They are the ones that know about the illnesses, they did not say anything to me.

Correspondingly, we once again see a range of causal interpretations, with respondents from Katanga attributing illness to the cold environment, God's will and the child had swallowed blood from the mother's womb, while in South Kivu most caregivers linked this mysterious combination of signs and symptoms to supernatural powers. For these mothers, the role of these supernatural powers was confirmed by the fact that the child died despite receiving modern or traditional care. This mother, who had taken her child to the traditional practitioner three times, explained,

There are bad gens or sorcerers in the air who bring this sickness and spread it in the village. If it wasn't sorcerers, you could pray or others could pray for you and cut the child, and the problem would be finished.

A second mother said,

The illness was brought on by evil spirits; I know because the situation only got worse even after treatment, this is why we went to the prayer room. The illness could not be cured by the health workers but needed religious treatment.

Most caregivers in Katanga did not apply home treatment, while half of the mothers in South Kivu administered care to reduce the child's fever.

Caregivers waited on average three days before seeking medical care. While all respondents in South Kivu first went to a health center, in the urban site in Katanga two caregivers took the child directly to the hospital, bypassing the health center because of the perceived severity and vulnerability of the young child.

In South Kivu, in all cases the first interaction with health providers was negative, with problems identified as follows: the local condition affecting the child's throat was not recognized or addressed; the family was dissatisfied with the medication given; or the health workers failed to understand the condition and refused to treat the child. In two cases, the families subsequently took the children home, where they died a couple of days later. The other parents sought additional care and eventually the children died in a hospital. Two children in urban Katanga died in the hospital after being treated several days, with one child first receiving outpatient care for two weeks. In a third case, the mother opted to go directly to the hospital; there, mother and child were placed outside of the emergency room, where they waited for three hours until the child died.

In the hospital, we waited three hours without treatment until the child died. The nurse had gone to Ward 6, and I stayed in the emergency ward crying. They gave nothing to the child between 2 and 5 pm, when the child died, and nobody tried to rescue us. Ten minutes before the child died, they asked me to buy a blood transfusion and also I gave 13000 F before they touched the child. Due to the pain I endured, I hope that the children of the nurses at the hospital never get sick...how can people who have children give treatment like this? One day this will come back to them, and they will pay for this.
(Mother of child who died of ARI, Dilala)

The final case from rural Katanga died at home after being treated and released from the reference hospital. Treatment costs in South Kivu were generally no more than 500 franc, while in Katanga care reached 17,000 franc.

While in South Kivu obstacles cited to obtaining good care were mixed, including a failure on the part of the health workers to recognize and treat the condition affecting the throat, distance, money and the health workers inability to understand the illness, caregivers from Katanga highlighted dissatisfaction with the quality of care, mentioning the unwillingness of health providers to touch and care for the child and failure to make a proper diagnosis and to administer appropriate treatment with money less often mentioned. This mother explained,

I had money when we arrived at the hospital. The only obstacle to getting treatment was the behavior of the health workers, the unwillingness to give treatment. (Mother of son who had died of ARI, Dilala)

Respondents repeatedly complained about the behaviour of the hospital workers, who they described as rude and insulting. For example, when one mother made a suggestion about caring for her child to the nurse, the response was: “I am the nurse, you, what do you know?”

3.13.3 Diarrhea

All caregivers indicated that the children suffered from watery diarrhea and fever, with causal interpretations once again entailing a wide range of responses, including an evil spell, the illness originating at birth, poor nutrition, the sickness associated with the tonsils, worms and measles. Neither of the cases in Katanga applied home remedies, while three of four caregivers in South Kivu attempted home management by applying allopathic medicine, porridge or medicinal plants.

While all caregivers took their children to a health center for treatment, the delay at home was long, averaging six days. One family waited two weeks before obtaining care, stating that they first tried to locate an herbalist. Initial careseeking was most frequently guided by the perceived severity of the child’s condition, with vomiting and weakness cited as danger signs. Careseeking experiences were mixed, with caregivers typically visiting at least two health centers before the child died; in one instance in South Kivu the caretaker sought simultaneous care with the traditional practitioner, believing the tonsils needed to be cut. In two cases, the child died either immediately upon arrival in the health center after a long journey or shortly after being treated, highlighting the danger in waiting until the condition becomes critical. In three cases, the family was not satisfied after receiving daily treatment in the health center, and decided to change approaches without consulting the health worker. In one instance the family took the child to a hospital, where he died two days later; in another, the family traveled nine kilometers to a second health center where treatment was refused due to insufficient funds. The family subsequently traveled 32 kilometers where the child died shortly after being hospitalized. In the third case, the child died a few days after the tonsils were cut. In a final case, the child was hospitalized for seven days before being discharged; he had a recurrence and subsequently died. No ORS was offered or recommended, and counseling on liquid and food intake was not given.

The most common and difficult obstacle to seeking treatment was distance to the health facility, which in rural areas was often 9 or 10 kilometers away. Several respondents also indicated that money was a problem, and illness causation and beliefs about appropriate treatment also served as a deterrent to seeking rapid treatment with trained health workers. Once again the behavior of the health workers, their unwillingness to treat due to the parents’ lack of money, and their perceived inability to diagnosis and treat the condition were cited as barriers to receiving quality care. This father said,

If only one of health workers were good, my son would not be dead. The nurse in Nzilo refused to treat because we did not have money, and the health workers in Mpwene and the Gecamine hospital could not even determine the condition my son suffered from.

Another respondent's statement underscores the lack of understanding between provider and caretaker:

The nurse said what the child had. But I didn't understand because it was in French. When the nurse talked to me I really didn't understand much. I did understand that they requested we bring the child back the next day but my child was already dead. He also asked some questions and explained things in French, which I didn't understand.

3.14 Decision Making

Information was collected from all caregivers regarding who at the household level was involved in decisions related to the child's treatment, whether others outside the household were consulted and who made the final decision regarding careseeking. The data presented in Table 6 show that in South Kivu the child's mother or the mother in consultation with her husband were most frequently involved in decision making, while in Katanga the mother and father generally consulted one another. In both sites, caregivers most commonly did not consult somebody outside the household for health care advice; when advice was sought, it was most often with a neighbor. We see that in South Kivu the principal decision maker for careseeking was most often the child's mother, followed by the mother and father together or the father. In contrast, in Katanga decisions were most commonly made by the child's father or through consultation with both parents. Interestingly, Figure 1 suggests that in the death cases the child's mother was less likely to be the principal decision maker in careseeking.

Figure 1. Principal decision maker in living and death cases

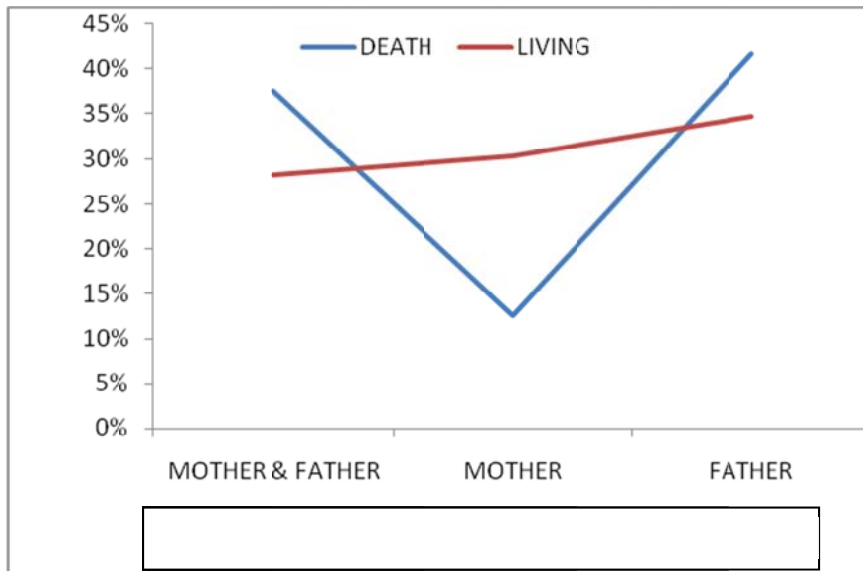


Table 6. Information collected on decision making about careseeking

	SITE	
	SOUTH KIVU	KOLWEZI
THOSE INVOLVED IN HOUSEHOLD DECISION MAKING		
MOTHER	34%	14%
FATHER	6%	6%
FATHER AND MOTHER	37%	60%
OTHER	23%	20%
OTHERS WHO GAVE ADVICE		
LOCAL LEADER	3%	9%
FAMILY MEMBER	20%	14%
NEIGHBOR	25.7%	31%
NONE	51%	46%
PRINCIPAL DECISION MAKER		
MOTHER	34%	15%
FATHER	29%	44%
MOTHER AND FATHER TOGETHER	29%	35%
GRANDMOTHER	9%	6%

IV. DISCUSSION

This in-depth review of health systems and circumstances which confront those seeking care for children under the age of five suffering from the three leading causes of childhood morbidity and mortality—namely, malaria, ARI, and diarrhea--highlights commonalities and differences according to each illness and site, with certain illness-specific patterns emerging. The study identified strengths and weaknesses related to the health systems and personnel and highlighted variations in the community-based approach that should be considered when modifying future strategies. Decisions regarding seeking care with bio-medically trained providers were generally guided by the perceived seriousness of the child's condition and vulnerability of young children. Those who did not seek care with trained providers often opted to self medicate at home, and traditional illness beliefs provided the rationale for obtaining care with traditional health practitioners. While over 92 percent of the death cases were eventually seen by someone with medical training, with over half reaching hospital facilities, the children died anyway. Study results illustrate a range of barriers to appropriate care that were encountered along the various routes to death for these children, as well as opportunities that could have saved lives. The detailed nature of the interviews highlight the complexity of factors that affect obtaining trained health care.

4.1 Contexts

The study sites presented different facilitators and challenges in regard to obtaining health care. In the urban center of Dilala, a wide range of health care options existed, including pharmacies and drug vendors that facilitated self medication at home. Moreover, the environment offered a variety of opportunities to earn or borrow money needed to pay for care; similarly, our findings show that Dilala residents were able to pay for much higher health care costs than elsewhere. Distances to the health facilities were short, and residents also had the option of taking a taxi. In contrast, the lack of income-generating opportunities and the dismal state of agricultural production in all the rural areas studied limited easy access to cash, impacting on the ability of and the speed by which residents could seek health care. This, combined with long distances to health facilities, which in rural areas often required over an hour to obtain care or several hours to access hospital care, presents major challenges to seeking timely treatment. In the zone of Nyangezi, mountainous terrain makes seeking health care, especially if the sick child must be carried, particularly arduous.

Traditional belief systems related to the local condition associated with the tonsils are profound and widespread in South Kivu. Beliefs about the locally-perceived illness were linked to all three of the diseases under study and repeatedly pushed caregivers to obtain care from traditional practitioners, thus interfering with treatment from trained providers, and likely contributed to the morbidity and mortality of young children. Efforts must be made to encourage trained providers to recognize beliefs about the condition and to develop health education messages and behaviour modification approaches to change the current dangerous practices that exist. Approaches must acknowledge the role of the traditional practitioners in treating the tonsils, and ways to modify their practices (e.g. only rubbing or applying an innocuous substance rather than cutting the tonsils).

4.2 Health Systems

Different combinations of partners with a variety of approaches caused challenges in managing health care in the zone. In rural zones, distances from communities to health centers were often big, going far beyond the 5 kilometers stipulated by the government. Moreover, the long distances from the administrative headquarters to certain health facilities made it impossible to carry out monthly supervisions in all health posts; as a result, those health facilities far from the central office remain isolated and receive little direction.

In three of the four zones studied, we found a lack of coordination between the personnel working in the health facilities and the reference hospitals, causing a breakdown in the continuity of patient care during emergencies. Typically, sick patients were transported long distances to reference hospitals, which likely aggravated already serious health conditions and may explain why so many children died shortly after their arrival in the hospital. Overall, we found that the reference hospitals offered poor quality care and that services are driven by monetary interests. Our data show that hospital health providers were often slow to respond to emergency cases, and some data suggests that health personnel contributed to the death of the children. The findings also repeatedly highlight the inappropriate and at times abusive behaviour of the hospital health workers towards caregivers. On several occasions caregivers indicated that negative encounters influenced their decision not to return to the facility in the future.

There are indications that the transition from offering free care to services that require payment is going to decrease utilization of curative care in South Kivu. While some residents will have difficulty obtaining cash to pay for treatment, our data suggest that the public has not been adequately informed about the change in approaches, which is causing much confusion and scepticism about the government health care system. In addition, efforts should be made to standardize approaches by introducing the same health care fees in all government health facilities existing in each zone and to regulate the utilization of services in adjacent health zones where care is free or costs are minimal. An important next step will be to sensitize the populations affected about the changed fees and prepare them for additional fee adjustments anticipated for the future. In Kolwezi, where a wide range of clients with different socioeconomic backgrounds and occupations exist, health personnel failed to establish mechanisms to ensure that families that were covered under other health programs offered by industries were not eligible to participate in the AXxes program.

4.3 Médecin Chef de Zone

We consistently found that the MCZs were frequently absent and not adequately participating in or overseeing their administrative duties. Rather, they preferred to be in larger cities where they could generate income and be close to their families. Their absences negatively affected the functioning of the health zones, as important aspects of their work such as monitoring and supervision of health facility activities was taken on by less qualified personnel or simply not conducted. Overall, the difficult conditions (e. g. poor pay, minimal logistical support, difficult living conditions far from their families, and lack of adequate equipment and qualified personnel to run the health facilities) under which the MCZ work provided little motivation to remain in the

health zones. Moreover, there appears to be no accountability of the MCZ, who virtually have free reign in their work and the way resources in the zone are utilized.

4.4 Nurses

Most of the nurses lived and worked in extremely isolated conditions lacking adequate medical supplies and even the necessary equipment to enable them to make simple diagnoses. The structure of the health facilities varied, with some being recently renovated while others were made of semi-permanent building materials. Lack of regular and quality supervision and minimal contact with the zone administrators clearly had an effect on the nurse's performance and the general conditions in the health centers, which at times were dirty and disorderly. The vast majority of the nurses were not formally recognized by the government and therefore were only officially receiving a minimal monthly stipend insufficient to cover living expenses; even those few who were on government payroll were not being paid regularly. Difficult working conditions and lack of incentive clearly diminished their level of motivation and commitment to nursing, and some nurses admitted that they were forced to steal medications to survive. We also saw a high attrition rate of nurses, particularly after they received additional training and were eligible for relatively well-paying positions in urban centers. In particular, nurses working in the rural zone of Katanga were often under-qualified, with most having received minimal nursing training.

4.5 Treatment Approaches

Approaches to providing treatment on credit varied in the rural zones, with some providers willing to accept debts or material goods as collateral to guarantee payment. Generally, there appeared to be a trend to phase out treatment on credit, as many health providers complained that communities in their health area had accumulated large debts that they could no longer absorb. This change in approaches created problems for community members in obtaining health care, particularly in South Kivu where residents claimed that they were unable to provide cash payments for unanticipated health problems. In contrast, respondents were generally able to pay for childbirth assisted by trained professionals, explaining that they could prepare in advance and save money over time. As indicated, we uncovered a wide range of consultation fees in South Kivu, which reflects the recent introduction to paying fees for service. This lack of uniformity in the fee schedule across the zone caused confusion amongst beneficiaries, resulting in people travelling long distances to obtain treatment in facilities where treatment is less expensive.

In Katanga, we found that health providers have outpatients travel daily to the health centers to receive care, claiming that caregivers are unable to follow drug regimens at home. While there were indications that this approach is in part implemented to make certain that payment for treatment is made, it is extremely difficult for caregivers to follow, as they may have to travel long distances daily over a seven day period to obtain care. Our interactions with community members repeatedly suggested that this approach dissuades caregivers from seeking prompt care, encouraging them to wait until the child's condition becomes very serious. In contrast, health providers in South Kivu often took into consideration the distance to the health center when recommending follow-up visits of sick patients.

4.6 Provider/Caregiver Interactions

We consistently found that communication between the health providers and caregivers concerning the illness episode and recommended treatment was insufficient. As a result, even after extended stays in health facilities, caregivers frequently left the health centers with little or no understanding of the child's illness, including the cause, accompanying signs and symptoms that allow caregivers to recognize the illness, appropriate treatment and preventative measures. In addition, health workers failed to gather information about the illness and other related careseeking episodes often critical to prescribing appropriate treatment. Given the poor communication infrastructure in DR Congo, and the limited access to health-related information, the failure of health workers to communicate with caregivers poses a huge missed opportunity in the provision of health care. Moreover, even when health providers did communicate with caregivers, we found they often used technical language or even spoke in French. As a result, the messages conveyed were frequently incomprehensible to the caregivers. In addition, counselling on feeding of solids and liquids was never given, and even simple but life-saving strategies that should have been carried out at home, such as the administration of ORT during diarrheal illnesses or the use of mosquito nets, were not recommended.

The unwillingness to convey important information to caregivers about the illness episode likely reflects the general lack of motivation felt by health providers. In addition, their approach (e.g. using technical language or French) when interacting with caregivers is likely to represent a need to show their superiority in the social hierarchy. The desire by health workers to demonstrate their status and dominance by creating social distances with clients has repeatedly been demonstrated in many parts of the world.^{4,5,6} This was particularly evident in the hospital setting where we found that health workers were intolerant, often reprimanding and criticizing caregivers and showing little concern for the sick child.

4.7 Medications

We uncovered two very different approaches regarding storage and distribution of medications. In South Kivu, where medications are stored in a Bukavu warehouse owned and operated by the Catholic Church, we found delays in the delivery of medications to health zones, forcing health workers to modify standardized treatment strategies and to purchase poor quality medications sold at higher prices at the local market. Drug shortages and the distribution of less effective medications had negative ramifications on the reputation of the care provided in the health centers. On many occasions respondents indicated that ineffective treatment in the health facilities encouraged them to seek care elsewhere. In contrast, in Katanga the NGO partner stored AXxes drugs in their own warehouses, giving them control over the delivery of medications and allowing them to avoid drug shortages. Correspondingly, we repeatedly heard both health workers and clients praise the quality of the AXxes drugs.

4.8 Community-based Approach

Study findings show big differences in the community-based approaches in the two provinces studied. In South Kivu, health committees continue to be active, serving to monitor health center activities and creating a liaison between the trained health workers and community members.

We also found that village leaders participated in monitoring health events and activities at the community level. The engagement of health committees and village leaders clearly served to bolster links with the community and to motivate the community health workers who were actively involved in a wide range of health efforts. Moreover, the relatively high percentage of female community health workers, who seem to be more willing to devote time to community health activities with little compensation and are often in a better position to convey health information to mothers of young children, appears to explain the sustainability of community-based work. In contrast, there was no functioning community-based approach in the urban center in Katanga, and in only one rural village were we able to locate a group of all male community health workers who appeared to be carrying out work in a desultory fashion.

4.9 Understanding of Illnesses and Careseeking Behavior

4.9.1 Malaria

In both sites we found a high risk perception associated with malaria, with respondents consistently expressing fear that the child could die or asserting that they had known a child who had died from malaria. Correspondingly, high risk perception appeared to allow caregivers to overcome obstacles and was associated with quick careseeking (on average two days after the onset of illness), with all cases first seeking care with trained providers. In addition, respondents indicated that there are no effective traditional treatments for malaria. Knowledge of malaria and how it is transmitted was alarmingly poor, with only two of nine respondents stating that it is transmitted through mosquitoes or insects. Very few households had the requisite mosquito nets, and those who did were using them for purposes not related to preventing malaria. Mapping of careseeking patterns shows that in South Kivu several caregivers subsequently sought treatment with other health providers, including traditional practitioners or pharmacists, because they were not fully satisfied. Care with traditional health practitioners was sought to address local beliefs and to treat the cultural condition associated with the tonsils, which was not recognized by health center personnel and required that the tonsils be cut. In Miti Murehsa, where health centers were experiencing drug shortages, we also found that a number of caregivers subsequently opted to buy local medications to treat fever, highlighting the importance of maintaining adequate stocks of drugs.

Those respondents who did not take their children to a health center indicated that the signs of illness suggested that the illness would pass quickly and that they could treat the illness at home with allopathic medications. Other commonly mentioned barriers to seeking trained care included lack of money and concern that the child would be transferred to a reference hospital.

While malaria continues to be the biggest killer of children and adults in DR Congo and has received endless attention from health donors who invest in both preventative and curative efforts, the lack of basic knowledge amongst respondents regarding the disease was striking. More formative research is needed to explore beliefs and practices associated with fever and malaria and to develop culturally appropriate communication initiatives to inform better the population about this deadly disease

4.9.2 Acute Respiratory infections

The lack of understanding regarding ARI and associated signs and symptoms was also striking. Our data suggest that there was no local term to describe pneumonia, and causal explanations for the child's illness were most often linked to the cold environment or supernatural sources. While the freelisting data suggests that residents in both research areas recognized cough as an important illness affecting young children, people failed to link cough and fever, generally assuming that the fever pointed to malaria. This tendency to compartmentalize illness signs and symptoms and the lack of appreciation of early illness signs is reflected in the careseeking patterns, which involved waiting three to four days at home before more serious signs, such as rapid and difficult breathing, triggered concerns that the condition had become very complicated, with caregivers often stating the child suffered from multiple illnesses, and prompting careseeking. In all instances where the child was taken to a health center, the report was that treatment was effective and no further careseeking was pursued. Barriers to seeking care involved lack of money, distance to the health facility, and the ability to self-treat at home. Once again, perhaps the biggest barrier was the lack of ability to recognize initial signs of ARI and their seriousness and to understand the importance of prompt treatment.

Children with cough and fever who were not taken to the health facility were first given medications in the household purchased from local pharmacies; in the rural site of Kolewsi, traditional plants were administered. Half of the caregivers in South Kivu sought outside help, either from the Red Cross agent or traditional practitioner, once again believing that the tonsils needed to be cut. In only one of six cases in Kolwesi was outside care sought, and in this case illness beliefs guided the mother to seek care from a Red Cross agent and traditional practitioner. Obstacles to careseeking in South Kivu uniformly related to the distance to the health center, while in Kolwesi the most common reason for not going to the health center related to beliefs that modern medicine could not treat the condition.

In relation to respiratory infections, we can again clearly see that lack of biomedical knowledge and the illness belief systems hampered prompt careseeking and influenced decisions to seek care with untrained providers. The study findings point to a strong need to inform the population on ways to identify ARI, the evolution of signs and symptoms, and the importance of obtaining prompt and biomedical treatment when the combination of cough and fever is identified in children.

4.9.3 Diarrhea

Respondents expressed grave concerns about diarrhea in young children, underscoring frequent and persistent stool output, vomiting and weakness as danger signs. Cited causes for the diarrheal episode included the ingestion of something unhygienic, or evil spirits; other respondents stated they did not know. While home management in South Kivu involved oral drugs, tea or nothing at all, in Katanga, caregivers administered more appropriate home remedies, with the majority giving ORS packets, which are believed to restore energy and stop diarrhea, or home fluids. However, the utilization of ORT was insufficient, often involving only one packet of ORS during the episode. Overall, only respondents living in the semi-urban center of Katanga consistently knew about rehydration therapy, and the importance of administering

ORT during diarrheal episodes. However, in these cases methods used to prepare ORS and homemade solutions were inconsistent and often incorrect. Rural residents applied medicinal plants known to purge the dirt in the child's stomach believed to cause the diarrhea.

The high risk perception appeared to push respondents to seek care from trained providers relatively rapidly, on average within two days of the onset of illness. While in Katanga caregivers only sought treatment from trained providers, in South Kivu caregivers once again took their children to the traditional healer to cut the tonsils believed to be the underlying cause of the episode. ORT was rarely prescribed by health workers, and there was no counseling regarding food and liquid intake. In South Kivu, illness beliefs and perceptions of appropriate treatment proved to be the biggest obstacle to seeking care with trained providers. In Katanga, urban residents indicated that they did not face any obstacles to seeking care, while distance was the biggest barrier in rural Katanga.

Those who failed to seek trained care most commonly administered medications at home in the form of antimicrobials which they indicated were less costly and equally or more effective than drugs given in the health facilities. The findings once again highlight the lack of knowledge and utilization of ORT or understanding of the importance of continued feeding. In these cases, explanations for the illness were mixed and did not relate to the biomedical cause. Only two respondents sought outside care, one to a Red Cross agent and the other to a pastor. The most common obstacles to obtaining care in a health facility included a strong belief in self medication and the distance and time involved in getting care in the health facility.

From a scientific standpoint, of all the treatment interventions evaluated regarding the major causes of child mortality, ORT has been determined to be the most effective treatment intervention, reducing the number of child deaths by almost three times compared to the next most effective intervention (antibiotics for sepsis and pneumonia).⁷ Our results highlight the lack of knowledge of the importance of ORT during diarrheal episodes and the corresponding low rate of utilization. Initiatives need to be undertaken to increase availability of ORS at the community level, to invest in communication efforts designed to improve diarrhea treatment, which should include continued feeding during episodes, and to emphasize appropriate and consistent messaging from the healthcare community.

4.10 Vaccinations

The results illuminate a general understanding of the purpose of vaccinations and a high value placed on their importance in protecting young children against disease. Respondents highlighted the ease by which children can be vaccinated, emphasizing the fact that they are notified about vaccination days in advance, there are no costs involved, and vaccinations are also administered in communities during campaigns.

4.11 Death Cases

Information collected through the death audits reconfirmed findings already presented relating to recognition of illness signs and symptoms, perceptions of illness severity, causality, and appropriate treatment. The death audits allowed us to map the multiple careseeking episodes

most caregivers of children with severe cases of all three illnesses followed with only two cases (both in South Kivu) failing to seek any treatment outside the household. The stories consistently illuminated the tremendous efforts made and the hardships families faced in attempting to treat and save their children, as well as the often catastrophic expenses they incurred in these efforts. Despite the fact that most caregivers had multiple and often prolonged interactions with health personnel, respondents typically demonstrated little understanding of the condition that killed their children. These cases highlight innumerable problems with the health system, including the refusal to treat severe cases at the health center level due to a lack of medications or equipment or because the family could not make adequate payment, forcing families to travel long distances with the sick child to seek alternative care, or a failure by the health personnel to diagnose the child's condition. The data also highlight the poor linkages between the zone health centers and reference hospitals; despite this, many caregivers, particularly in Katanga, reached a hospital setting. In the hospital settings, we found long delays in administering care to emergency cases and mistakes made in diagnosing and treating patients that likely contributed to the child's death. Several children appeared to be released prematurely, dying shortly after they returned home. Our data also revealed inappropriate behaviour of health workers, particularly in hospital settings, who repeatedly showed disrespect towards caregivers and a lack of interest in the welfare and survival of their sick children, with some caregivers even mentioning that health workers were unwilling to touch or provide care for the child. In South Kivu, we once again found caregivers resorting to traditional treatment practices after the health workers failed to acknowledge the local condition; they often concluded that modern medicine was ineffective and therefore inappropriate to treat the underlying cause of illness. Severely ill children who had their tonsils cut generally died shortly after the procedure.

V. CONCLUSIONS

The main purpose of this research was to examine home care and careseeking behaviours for the three leading causes of child mortality--malaria, ARI, and diarrhea--and to identify barriers and facilitators to seeking care with trained providers. The study was conducted under the AXxes project; a major focus of the project is to enhance the functioning of the health zones and facility services through the training of health workers, rehabilitation of centers, support of health zone administrative activities, and supply of medications and equipment, with an overall goal to improve access to curative care. The study also allowed us to carry out an in-depth investigation of health personnel, health systems and community efforts, which constitute crucial components to improving access to health care. While AXxes has made a critical difference in beginning to reconstruct health zones, the study results illuminate the tremendous challenges faced in improving health services in regions suffering from years of neglect and war. The study results highlight the general hardship and isolation faced by populations, particularly living in rural areas, where communication and road infrastructures are limited and income-generating activities are virtually non-existent. The findings elucidate the need for improved outreach at the community level designed to share basic health-related information and to distribute essential drugs and supplies to rural populations. The results also underscore the tremendous need to improve livelihoods through development of improved farming systems and income-generating activities.

The general lack of understanding about the three leading illnesses causing death of young children with regard to the illness signs and symptoms, causation, and appropriate treatment and prevention, was alarming. Our findings show that obstacles to seeking health care with trained providers were mixed and not solely related to cost and payment as is often hypothesized in DR Congo; in fact, in Katanga, where health care is far more costly, careseeking behaviours more frequently involved obtaining treatment with more expensive trained providers. The data illustrate that a tremendous obstacle faced for all three illnesses relates to lack of adequate knowledge together with local belief systems that often interfere with obtaining care with trained providers. In rural areas, where distances are great, distance was frequently mentioned as a barrier to seeking care. Lack of access to money in areas where subsistence farming is practiced also presents a major obstacle when cash payment for health care is required. Concerns about the quality of care and the behaviour of the health workers were commonly cited as barriers, and our in-depth investigation of health systems and personnel confirm the failure of the health structure to provide even basic services to the population. This, in part, may explain the common practice of self-medicating at home. Other barriers often not mentioned in the literature included an absent husband, making careseeking impossible, concerns about being referred to a hospital, and a debt at the health center which made the family ineligible for care. The study findings highlight the need to re-examine the current health structure and to carry out major reforms in the provision of health care.

VI. RECOMMENDATIONS

Based on the study findings, we recommend the following:

Increase efforts to strengthen community-based activities, including outreach, information dissemination and economic development

1. Combine health and agricultural development programs designed to increase food production
 - introduce plant varieties that are more resistant to disease
 - improve marketing systems
 - improve soil fertility
2. Introduce micro-finance projects in rural communities, learning from some of the success stories in South Asia
3. Strengthen the community health worker system
 - introduce sustainable and more profitable ways to motivate community health workers (micro-finance, raising animals)
 - involve the community workers in approaches that can generate regular revenue for their services (distribution of mosquito nets or vitamin A, routine vaccination, selling of ORS packets)
 - change the selection criteria to ensure greater participation of women
 - improve training and ensure regular refresher training
 - ensure routine, quality supervision
4. Better integrate the CODSA and traditional chief system into community-based efforts
5. Improve approaches used by the community health workers to inform the population about health care
 - use different strategies such as group sessions
 - develop visual aides
 - target other family members such as fathers and older family members who are involved in decision making
6. Integrate other associations (church, schools, local health providers) and opinion leaders into the community health approach
7. Ensure that the price for health care is well understood and inform populations in advance about changes in health care fees
8. Develop an approach to make emergency health funds available at the village level

Invest in communications efforts designed to improve the understanding of the three leading illnesses and their corresponding treatment by caregivers, health workers, and pharmacy workers

1. Develop and implement a multi-pronged approach to improve treatment among the various key players in the community, since caregivers need and depend on formal and informal advisors
 - health worker trainings should be complemented with appropriate messaging directed at primary caregivers, other family members, pharmacy workers, community health workers, traditional healers
 - communications efforts should employ multiple avenues to convey simple, consistent messages, with a focus on interpersonal communication

2. Develop and diffuse simple messages to prevent confusion and to maximize adherence. For example, in the case of diarrhea:
 - ORS (as opposed to sugar-salt solution) should specifically be recommended, whenever possible, to caregivers of children with diarrhea
 - continued feeding should be recommended for every case of watery diarrhoea
 - caregivers should be reminded that antimicrobial agents should only be used upon prescription by a health worker
3. Emphasize the value of consistent messages from health and pharmacy workers. For example:

Develop strategies to improve the communication and behavior of health workers when interacting with clients

1. Promote the importance of positive and clear communication about illnesses, treatment, and prevention with caregivers through training with health workers
2. Emphasize the importance of the caregiver/health provider interaction, promoting the show of respect so that mothers feel comfortable sharing information regarding the illness episode and posing questions
3. Develop strategies that incorporate local belief systems regarding illness episodes and health care
4. Carry out training on the ethics of medicine and the role of trained health agents
5. Institute a way to evaluate health care provider performance

Offer treatment strategies so that care is more accessible and acceptable

1. Offer essential medications for treatment (e.g. antibiotics for cough and fever, ORS for diarrhea) of the three leading killers of young children at the community level
2. Modify treatment strategies so that caregivers do not need to travel back and forth from home to the health center to obtain medications each day
3. Reduce the numbers of unnecessary injectible and intravenous drugs used by health workers

Ensure that medications reach the health zones in a timely fashion and are available to the poorest populations

1. Develop strategies that ensure that AXxes medications are controlled solely by the partners without going through an intermediary group
2. Enforce a system that ensures good communication between Kinshasa, the AXxes partners and the health zone to avoid inadequate supplies of medication
3. Develop mechanisms that better ensure that the medications are utilized by the AXxes target population and are not given to other clients already under health coverage
4. Inform the target population that through the AXxes program quality medicines are available for their use at a reduced price

Evaluate how the health zones can be better managed

1. Assess whether the head of the zone must be a doctor
2. Institute a system to evaluate performance of heads of zones that corresponds with the AXxes indicators and program
3. Ensure that supervision of health centers is regular and of high quality

4. Try to coordinate activities with other partners in a way that best exploits and complements the resources available
5. Continue to rehabilitate and construct health structures, selecting sites based on need

Assure that health workers are motivated by the government to carry out their work

1. Recognize that the health workers are formally part of the government structure
2. Pay health workers regularly with a salary that minimally covers living expenses
3. Assure that health workers have lodging and other daily needs so that they can live and work comfortably in the health centers

Develop approaches that recognize traditional health workers/formal organizations

1. Identify ways to integrate traditional practitioners into the health approach (e.g. referrals)
2. Train traditional health workers on safe approaches and the importance of referring severe cases to health facilities

Use the data collected through this study to carry out the following:

1. Carry out a quantitative study on health careseeking
2. As part of a quantitative study, develop study questionnaires
3. Develop and test culturally appropriate messages on the three illnesses studied

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