USAID'S HEALTH EVALUATION AND APPLIED RESEARCH DEVELOPMENT (HEARD) PROJECT

Community Case Study: Korogocho, Kenya

Urban Health Assessment: Child & Adolescent Nutrition & Water, Sanitation and Hygiene in Nairobi, Kenya

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Executive Summary

Background: Children and adolescents living in urban informal settlements are vulnerable to nutrition and health deficits, but little is known about contextual vulnerabilities contributing to poor nutrition in these two groups.

Objective: The aim of this case study was to understand 1) factors which contribute to poor nutrition, water, sanitation and hygiene (WASH) among children and adolescents living in slums/informal settlements and 2) solutions put in place to address these challenges with an aim of identifying effective interventions and key areas which require intervention.

Methods: A community mapping exercise was conducted in Korogocho slum. During the exercise, key stakeholders from government, non-governmental and community-based organizations and institutions provided information on going programs, key actors in Nutrition and WASH as well as challenges faced during program implementation. Participatory GIS was also used to show the distribution of nutrition and WASH services targeting children and adolescents. This involved pinning the location of on-going programs on a printed map. The community mapping exercise was complimented by key informant interviews with key stakeholders and focus group discussions with community members.

Findings: Children and adolescents are faced with various nutrition and WASH vulnerabilities such as poor access to adequate amounts of quality food, which results in coping strategies such as stealing and scavenging. They also have poor access to health services, which is mainly attributed to lack of drugs in health facilities, poor client staff interactions and long waiting times. Children and adolescents aged between 5 and 19 years only accessed health facilities for curative services. Poor access to safe water and toilets was also reported and it was associated with diseases such as diarrhea. All these vulnerabilities were attributed to poverty. There were various programs and interventions running in the community, but some did not address the needs of the community. This was attributed to the lack of community involvement in the planning and implementation process. Nutrition programs mainly targeted children under 5 years. Although social behavior change communication on Nutrition and WASH was available, there appeared to be inadequate coverage as some respondents were not aware of the information that was available. Furthermore, respondents highlighted that they lacked resources to put in practice the information they had received.

Conclusions: Children and adolescents in Korogocho are faced by various nutrition and WASH vulnerabilities which can be attributed poverty. Although there are several programs and interventions addressing these vulnerabilities, most focus on children under 5 years and they do direct needs of slum residents. There is therefore a need for more comprehensive poverty alleviation programs which are designed and implemented with input from the target community.

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Introduction and Aims

The community case study presented an opportunity to do an in-depth analysis of a specific urban slum or informal settlement with an aim of answering the overall assessment question: What contributes to poor nutrition among children and adolescents and what solutions can be used to best address their needs? The case study aimed to identify: 1) Nutrition and WASH issues affecting children and adolescents and 2) Ways of improving implementation of Nutrition and WASH programs.

The case study was conducted in Korogocho slum, located north-east of Nairobi about 12 km from the Nairobi Central Business District (CBD). Korogocho is the fourth largest informal settlement and it is considered to be one of the most congested slums, with over 250 dwelling units per hectare. It covers an area of about 0.97 km^2 and it is mainly made up of semi-permanent structures made of mud, timber and iron sheets. The houses are built in rows with an average of six dwelling units (rentable rooms) per structure. The Nairobi Refuse Dump site is situated to the east and south-east of the slum. The slum has a stable and settled population, with many of the residents having lived in the area for many years.

Methods

Qualitative data collection methods were used in the case study. Table 1 provides a summary of the community case study methods and the target population for each. To gain entry into the community, we first engaged community leaders and informed them of the aim of the project.

Table 1: A summary of the case study methods used for data collection

Method	**Rationale for Method**	**Participants**
Community Mapping with key stakeholders in the community	Participatory process for determining context of systems, services and key players as it relates to child nutrition	Non-governmental and faith-based organizations, sub county health officials working in public health, Nutrition and WASH, community-based organizations, local institutions (daycare centers, schools, early childhood centers)
Key informant Interviews	To validate the mapping and to get more in-depth information around perceptions, behaviors, challenge and opportunities related to child and adolescent nutrition and WASH	Non-governmental and faith-based organizations, sub county health officials working in public health, nutrition and WASH, community-based organizations, local institutions (daycare centers, schools, early childhood centers)
Community Workshops (Focus Group Discussions)	Participatory process that draws from a diversity of perspectives from within the community to inform solutions for improving child and adolescent nutrition and WASH	Caregivers of children under 5 years, Adolescents (10-14 years and 15-19 years), fathers, Children aged 5-9 years and community leaders

Community Mapping

The community mapping exercise aimed to identify key actors and organizations required for the successful design, implementation and uptake of maternal, childhood and adolescent nutrition and WASH focused interventions. The mapping exercise was done during one of the community participatory workshops (Table 1). The target group included directors, leaders, or managers working for Community Based Organizations (CBOs), Government (county and sub-county health team), Non-Governmental Organizations (NGOs) and academic stakeholders working in the community. Participants were identified with assistance from the community administrative committee team in Korogocho. They were eligible for the mapping exercise if they met each of the following criteria: 1) had adequate knowledge or experiences related to adolescent and childhood nutrition and WASH issues in urban areas 2) spoke English- or Swahili and 3) were able to provide written or verbal informed consent.

The following information was documented during the mapping exercise: key actors, source of funding, roles/areas of focus, target group, interventions. Data was captured using tape recorders and structured table templates, which participants used to record key actors, platforms and current interventions and programs in the community.

We also used a Participatory Geographic Information System (PGIS) to map areas where various services and programs are located. A map of the community was provided and community members were requested to pinpoint areas where various services/programs targeting adolescents and children under 5 years are located. The services/programs were color coded for easy identification.

Key Informant Interviews

The aim of the key informant interviews was to collect more detailed information on the roles of different organizations and on-going programs and interventions in the community as well as barriers and facilitators to improving adolescent and under 5 health, nutrition and WASH. Key informants were identified during the community mapping exercise. They included: sub county health officials, local administration, youth leaders, local education institutions, community-based education and non-governmental organizations. All these actors provided a wholistic view of vulnerabilities, quality and accessibility of services provided from the service provider to the recipient's perspective.

Interviews were conducted by two trained field assistants: an interviewer and a note taker with support from a member of the research team. A tape recorder was used to record information. Interview guides for key informants and discussion guides for focus groups were pilot tested and revised as needed.

Community Workshops

Six focus group discussions were held with selected community members and community leaders. The focus of the group discussions focused on the following domains: care-seeking for health, food systems/services and socio-economic and cultural vulnerabilities.

Data Analysis and Synthesis

Data collected from the mapping exercise was summarized in tables describing institutions, local service providers, specific system actors, barriers and opportunities for engaging with non-health nutrition organizations. The research team captured all the important relationships in the system. In addition, bottlenecks or gaps in the system were considered. Finally, areas where stakeholders made progress/or experienced challenges on their intended WASH and nutrition programs were detailed. Details on lessons learnt from the different stakeholders were also evaluated.

After each interview and FGD, a debrief session was held with the research team to detail the emerging themes. The information collected from the community and key stakeholders was then transcribed verbatim. Transcribed data was saved in MS Word format. The researchers familiarized themselves with the data by listening to audio tapes and reading through transcribed records. A codebook was then created based on predetermined and inductive themes. Transcribed Word files were imported into NVIVO 12 software (QSR International Pty Ltd, Don Caster, Victoria, Australia) for coding and further analysis. Additional codes that came up during the analysis were also included.

Data was coded and a cross-check was done by an additional person to assess the quality of coding. Final checks for consistency of the application of the codes was undertaken by a third member of the research team. Codes were derived based on main themes developed from literature, initial reading of the transcripts, and the study objectives. Analysis of the transcripts will be mainly deductive, based on preexisting themes. Finally, data collected from different stakeholders will be compared for coherence.

Results

A summary of the number of interviews and study participants is presented in Table 1. Out of the planned 40 interviews, only 32 interviews, 9 FGDs and 23 KIIs, were conducted. The 8 interviews did not take place either because of bureaucracy (2) or refusal to participate in the study (6). All participants who declined to participate were either from CBOs or NGOs.

Table 1: Case study interviews conducted

Interview type	Participants	Number of participants
Focus Group Discussions (FGDs)	Caregivers of children 0-<5 years	8
	Caregivers of children >5 years-9 years	7
	Caregivers of Adolescents	8
	Fathers with children 0-19 years	8
	Community leaders	8
	Teen Mothers	9
	Adolescent (15-19 years)	16
	Adolescents (10-14 years)	8
Key Informant Interviews	Sub County Officials	6
	Community health persons	2
	Local administration (chief)	1
	Community leaders (Village elder and a CAC member)	2
	Youth leaders (a male and female representative)	2
	Local education institutions (Day Care, Early Childhood Development Education and schools)	3
	CBOs and NGOs	5
	Total	**93**

Nutrition, Care and Service Vulnerabilities

The nutrition status and health of children under 5 years and adolescents was reported to be poor. Malnutrition, characterized by stunting and low weight was reported to be common among children under 5 years, especially among those born to adolescent mothers. Infectious diseases such as diarrhea was also reported in this age group. Among adolescents, underweight and stunting were reported as common forms of malnutrition.

> *"Many children are left at home without food or just a cup of porridge for the whole day. It is not a surprise to find young children taking care of their siblings as their parents; mostly the mother goes out to look for money to sustain the family"*
>
> *– Women, Mukuru Kwa Ruben.*

Undernutrition among children and adolescents was associated with poverty caused by either unemployment or low income. Poverty was associated with poor access to food and this was reported as a barrier to exclusive breastfeeding. Young children were also offered family meals regardless of their ability to consume these foods. To address the issue of food access, different coping strategies were used. These included: consumption of fewer meals, intake drinks such as black tea or water, sleeping hungry, begging for food, stealing food, skipping meals, buying street foods, consumption of low-quality foods that are cheaper, consumption of stale foods, borrowing money from friends and begging, scavenging for food in dumpsites and engaging in prostitution were used. Adolescents also reported engaging in child labor in exchange for either food or income to purchase food.

> *"Because like me, I am a 'hustler'. I don't have anyone to fend for me. So if I don't eat, what will him/her breastfeed? So you see, I don't breastfeed my child and he/she also stays like that. You are supposed to eat so that your child eats, so you even find yourself giving the child porridge early."*- FGD Caregivers of children under 5 years

Maternal employment/unemployment was also cited as a cause of undernutrition and poor infant and young child feeding (IYCF) practices. This was because caregivers who worked or sought employment spent a large proportion of their day at work. This therefore limited the time allocated to food preparation and IYCF. For example, mothers who worked or sought employment outside their home were not able to exclusively breastfeed their children and were therefore reported to introduce complementary foods early.

> *"I can't say all mothers do exclusive breast feeding on the 0-6 months, some will do, some do not depending… like now in Korogocho it depends with the availability of the mothers, if the mother is available for the child then they would, but when the mothers go for casual jobs then exclusive breastfeeding for then is a bit difficult they will not, now they start complementary feeding…"* - KII Sub County Official

Low income was reported to be a major determinant of the type of food consumed as many households depended on daily wages. Participants therefore opted to consume ready-made street foods, which they considered to be cheap and convenient, as less time is spent on shopping and cooking. This translated into more time to seek gainful employment. Poor feeding practices such as infrequent meals and consumption of monotonous diets in adolescents, infants and young children, were also attributed to poverty and lack of knowledge on appropriate IYCF. Caregivers

were reported to lack knowledge about foods to offer children, and therefore, they prioritized satiety over diet diversity. More attention was given to infants and young children than adolescents. In some cases adolescents were considered to be adults and were therefore expected to be self-reliant.

> *"What I can say we don't give children proper nutrition because sometimes we don't have money. A child is supposed to be given proteins, mixed with starch, such things. You should not give him/her one thing but because of money, we don't give children proper nutrition. Let us say, if it is rice, you give him/her plain rice without adding anything else…."* - FGD, Caregivers Children Under 5

> *"Nutrition for adolescents is not good and this is caused by poor economic background, maybe their families are not financially able and this contributes too many adolescents going to dumpsites. Like right now the largest population at the dumpsite is of our young age, someone eats dirty food that has not been inspected and many fall sick. All this is because they are not financially stable."* - FGD Adolescent Aged 15-19 years

"Most vendors do not take care of the area where they sell food from to make sure that it is clean. If you look at the surrounding area and only buy from clean vendors, you will sleep hungry." –**Photovoice**

Daycare centers were cited as a common source of alternative child care services, especially among caregivers who were employed or were looking for employment. These centers are reported to offer care from early morning to late evening. Although some centers provided meals, they tended to be monotonous due to the lack of funds to purchase nutritious foods. In other day care centers parents provide meals for their children. However, sharing of the meals such as therapeutic foods was reported to be common as not all parents provided food for their children. This compromised the child's nutrition status as some children did not meet their energy requirements. Health workers reported that most of the children who presented with malnutrition in the health facilities were taken to daycare centers.

> *"You know, as the parent feeds her child, she can be observing her child. It is not the same way that woman you have left with will take care of your child. And maybe that woman has been left with about 5 or 10 children and maybe you have given yours good food and those others who have been brought have not carried food similar to yours so maybe your child's food is given to the others." - KII Village Elder*

> *".Some of these children we put them on the program the OTP program but they end up sharing the commodities so the child you are targeting is not able to improve on the nutritional status hence the child keeps on coming for the program for two months, three months until you discharge on the non-respondent child."* - KII Health Care provider

Children attending school aged between five and nine years were perceived to have better health and nutrition status than the under-fives and adolescents and this was attributed to school feeding programs. School meals were reported to be the main source of food for some children. Consequently, children limited their food intake in school so that they could take food back home to their siblings. In some cases, children were not offered extra meals at home because their caregivers assumed that they had eaten at school.

> *"At least them they are lucky because when they get to school they eat githeri which is balanced. There is maize and beans so at the end they have at least a meal that can contain them. .....There are some children who ……the areas from which they come from they can`t afford food they do not have the luxury of three meals in a day .They will even take the leftovers from school to go and give to their siblings at home. There are cases where teacher`s now understand now that you know. Now this child, `I know when they go home, they do not have food so whatever remains their packed and they are given to take home and that's from Monday to Friday. Saturdays they are not in school."* - KII, Stakeholder from CBO/NGO

School meals in public schools are supposed to be provided for free as the program is supported by the Ministry of Education. However, study participants reported contributing money towards the program. This posed a challenge to children who came from households which are not able to afford the meals. In such cases, parents resorted to giving their children money to purchase street foods which are cheaper than school meals. In some schools, the feeding program was not fully operational and children therefore purchased carbohydrate-based street foods.

> *"..in my school most of these parents normally give their children ten shillings because…. We used to have a feeding program but because of one reason or another, right now we are not providing food for them. The only food that we provide for them is porridge so, during lunch time these kids will come with ten shillings and then they will go and buy rice from a 'kibanda' (local kiosk) and most of them will not buy rice they will buy something we call anyona which is a bread (rejected factory bread) and that is what they use to survive with…"* - KII, Early Childhood Development Teacher

The main meal offered in schools was *'githeri'*, a mixture of boiled maize and beans, but some private schools provide meals such as rice and beans. Githeri was considered to be unappealing by school children and parents because it was the only food offered and it was not well prepared. As a consequence, children opted to substitute their school meals with street foods. The lack of diversity was attributed to lack of financial resources to run the feeding program. In contrast health staff reported that the meals offered in schools were balanced and well prepared.

> *"..but on feeding of the other bigger ones, I tend to see they are better off because schools are providing food, the meals in school are changed and balanced, if it is Githeri, there is maize and beans, the food is fried and maybe at times they are given fruits,…"* - KII Nutritionist

> *"It is 'githeri' (mixture of maize and beans..., it is cooked with 'magadi' (bicarbonate soda)...or at times, it is not well cooked. You find that a child comes home, 'my stomach is aching' and you see the child diarrheas such a thing."* - FGD, Caregivers of Children Aged 5-9 years

> *"It is still githeri mum and it was just boiled without anything added. It didn't have salt, it wasn't sweet, it was tasteless, and they had not even removed stones from the maize."* - FGD, Caregivers of Adolescent Aged 10-19 years

Health Seeking Behavior

There is only one public health facility in Korogocho which offers services for free. Most residents reported that they preferred to use the public health facility, which has limited staff numbers. Consequently, the health facility is usually very busy and this was reported to lead to long queues and waiting times at the facility. Some participants reported that they preferred to use private health facilities where they pay for services.

Children under 5 years were reported to have relatively good access to health facilities. This was attributed community health volunteers who conduct community outreach programs which create demand for health services. In contrast, school going children and adolescents, boys especially, were reported to have poor access; they only accessed health facilities for curative services. Adolescent girls also accessed health facilities for family planning services. Poor utilization of health care services among adolescents was attributed to fear of being tested for HIV, the long queues in the public facilities, lack of privacy, lack of drugs and poor interactions with health staff. High cost and lack of drugs were highlighted as factors which limited access to health facilities by both adolescents and caregivers of children under 5 years.

> *".. zero to five they normally depend on their parents. So when they are sick it is up to their parents or the care giver to bring them to the health facility. So what I can say health behavior is not that bad at least they are referred to the facility and also we have the CHV that we attach to different health units so when they see there is a child who is sick and is not brought to the facility they normally follow up and they are referred to the health facility."* - KII Youth Leader

> *"The source of many challenges is family because if your family does not have money. That is one challenge and so even if you fall sick and go and tell your mother that you are sick, you are just adding on her stress and that means that it is not only you who is affected but the person you are with is also affected. So you will be forced to look for alternative ways to get treatment. Mostly it is poverty."* - FGD Adolescents Aged 15-19 years

> *"…Because pregnant adolescents feel like the services close to them are not friendly or they require payment, then they go too far of facilities to meet these needs. Adolescents seeking to get health services that they do not pay for due to their limitation with finances.*
> "*I started going to clinic early but they used to see me as a child, I am 16 years and they were not treating me well, they used to talk to me in a rude way because I am*
> *Young..."*- FGD Adolescent Mother

Recommendations on How to Improve Utilization of Health Facilities

The following are some recommendations on how to improve utilization of health care services provided by study participants:

1. Adolescents should have a designated time when they can receive health care services

   > *"..They raised their desires of getting a private place for this kind of service (health care for adolescent mothers)…. So I have never understood their challenge and what brings this problem in mixing with other people….. but their desire is to have their own place and their separate day…… There are others we were talking with last week and they were suggesting that after the closure of services at 3:00pm they can be getting their services at that time …"* - KII Community Health Volunteers

2. There should be specific doctors/ clinicians who attend to children

"Okay ideally if we could have a specific like clinic whereby maybe these children the under-five are just seen by different clinician at least it will easy up or it will also encourage even the mothers to be bringing children to the health facility thus you will find sometimes the same clinician who is looking after the kids is the one who is also treating the adults so sometimes it is not that good." - KII Sub County Official

3. The number of health staff should be increased in public health facilities to reduce and ease the workload
4. Health professionals should be trained in youth-friendly services

Water, Sanitation, Hygiene and Environmental Vulnerabilities

There was consensus from the community members that water was available in Korogocho slum, but the main challenge was access as most residents purchased water. The cost of water was reported as a major barrier to good hygiene as residents rationed water. The quality of water was also considered to be poor as most of the water was prone to contamination from sewerage systems which were reported to be close to main water sources. Despite this, participants revealed that they did not treat water before use, mainly because of the cost implications of the water treatment process. Poor access to safe water was associated with waterborne diseases such as diarrhea and typhoid. Poor food hygiene was also reported, especially among food vendors. This was attributed poor hand hygiene practices.

"We do buy water. When you remember that you want the children to eat plus you the mother plus the father you put water in one basin, and not even a lot of water, and soap. Whoever comes from out there having touched any dirt washes there, even one who is from the toilet washes there. You see there, there is no cleanliness you are maintaining because whoever is from the toilet brings his/her dirt there, a young child like this one, you don't pour that water, you wash him/her in that water…." - FGD caregivers of children under 5

"These Pipes are used to transport clean water and sometimes there are broken sewer pipes right next to clean water pipes that are used in homes to cook and clean. Due to the demand for water it's hard for people to know whether the water they are consuming is good or bad. So they end up using that water without treating it."

-Photovoice

"There is contamination…okay some time back there was a case we had where almost like the whole week all the pipes which were bringing water to Korogocho was kind of contaminated. Like you would take a glass of water which strongly smelled sewer. It was that terrible. It took a week for it to be corrected. Because most of the water pipes do leak, especially during the rainy season they do leak. So this is when there is contamination. Apparently not everybody can afford to boil water because now people here use kerosene. So will I buy kerosene to cook or boil with

it? So again, the issue of high cost of living is an issue. So I can't say the water is safe, not really. Of course that is why we have cases of diarrhea, that's why we have cases of typhoid... " - KII Local Administrative Member

Poor toilet coverage and access was also reported in schools and households. Poor access to toilets was also attributed to insecurity especially at night, damaged and dirty toilets. In households, poor access to toilets resulted in sharing of toilets with other residents, paying for toilets or disposal of fecal waste in the environment also know "flying toilets". The lack of proper sewerage systems also resulted disposal of fecal matter in rivers and the surrounding environment. This was associated with a high risk of infections especially among children. In schools, poor coverage of toilets was associated with infections especially among girls.

"*So all of you, when the bell for break rings, you all run there. Now there, everyone has their own different illnesses, so it is very easy to contract illnesses.*

If you go to schools, by the way, you know, when you go to school people go there to defecate and maybe they don't pour water. So, like us girls also get infections in the private parts…" - FGD Adolescents, Aged 10-14 years

Lack of proper solid waste disposal systems was also reported. This was attributed to the lack of a designated area for garbage disposal. Participants reported throwing rubbish by the roadside, in trenches or in the environment. This was associated with diarrhea in children who failed to wash their hands after playing near trenches. Rubbish disposed in trenches led to blockage of drains which resulted in flooding during the rainy season. Disposal of hazardous material in dumpsites posed health risks to the community as some of the waste emitted fumes, which were associated with respiratory infections.

"…garbage collection here is also a big issue because it is very common to find piles of garbage that has lasted days, even weeks to be collected. They are very common sites. Okay, so in such kind of environment, we expect a lot of flies which is… and rats. They contribute to diseases because they transmit these diseases." - KII, Stakeholder from CBO/NGO

"Garbage, there is even one that has discarded even pampers, has come and gotten stuck there, dirty things have come and gotten stuck there, now let's say if it has rained, it blocks the trench completely. So it gets near the house and there is a small child…, that thing affects her/him, when it affects her/him she/he becomes weak (meaning fall ill)." - FGD Adolescents Aged 10-14 year

Houses in Korogocho are mostly semi-permanent structures, which are built close to each other. Participants associated overcrowding with respiratory infections and airborne diseases. Most houses consist of worn out iron sheet roofs and cemented floors; during the rainy season water participants reported flooding. Because children mostly slept on the floor, they were at risk of infections such as pneumonia.

Recommendations for Improving WASH

1. Need to improve the sewer and drainage infrastructure and ensure proper maintenance by unclogging the drains

   "On drainage,….there are very many drainages, the drainages should be made the way roads are like the tarmac roads, when you get to those corridors they should be clean to

improve the environment… They are clogged with waste, if they can help us unclog so that water can flow nicely and also for it not to clog with waste" - FGD Adolescent Aged 15-19 years

2. Provision of soap and buckets to caregivers to facilitate hand washing practice in the households

   "…So if we could be brought for soap to be washing the children's hands and that small bucket. You see, if you place it there you will be remembering, if you place it somewhere in the house you will remember that child needs to wash his/her hands but just like that, we cannot remember. You will just place food there for him/her and most of the time you don't prepare for them lunch, they eat from those women on the road so that woman will not remember to tell her/him to wash his/her hands but if everything is there, the children themselves will be seeing, they won't have to be told, they go and wash hands there…" - FGD Caregivers of Children under 5

3. Communities/residents should come together and fundraise to ensure that they have access to water in their plots

   "…but it is we the residents of the plot who united, contributed money and had it installed it because we used to fetch water and were spending money so we decided we will reach a point when we will be broke and where will we get money for buying water. So I can say our place is a little bit clean but if you look at other places, they are dirty because water has not yet been installed inside the plot. So it should be installed in all the plots" - FGD caregivers of adolescents Aged 10-19 years

4. Water should be made available to slum residents

   "…You see, if there is water, hygiene will be okay because when you come from the toilet you wash your hands and the water flows, another one, let's say it is a child who is from playing comes and washes his/her hands, that water just flows." - FGD Caregivers of Children under 5

Key Actors in Nutrition and WASH

The key actors in Nutrition and WASH working in the community included institutions such as schools and health facilities, non-governmental organizations and community-based organizations. The platforms used by these organizations to reach the target population include use of schools, health facility and community forums. Figure 1 shows the distribution of nutrition and WASH services in Korogocho. There was uneven distribution of facilities especially towards the sorthern part of the Korogocho. One participant highlighted that the lack of nutrition services in explained why there were many malnutrition cases in that area.

Figure 1. Map produced during the community workshops showing the distribution of Nutrition and WASH services in Korogocho slum

Note: The red pins represent nutrition and WASH services targeting children 0-9 years; light blue pins- 10-19 years adolescents Nutrition; dark blue pins- 10-19 years WASH; white pins: 10-19 years Nutrition and WASH; yellow pins- 0-9 years Nutrition; Green pins- 0-9 years WASH

Participants also mentioned potential non-health actors who can be engaged in nutrition and WASH interventions. These included: financial institutions, religious organizations, child protection organizations and women groups. Table 3 shows a list of potential non health actors who can be engaged in nutrition and WASH interventions.

Table 3: Potential non-health actors to be engaged in Nutrition and WASH

Organization/Institution/Persons Name	**Perceived role**	**Address immediate care or food access**	**Target group**	**Barriers**
Financial Institutions i.e Banks /Table banking	Economic empowerment	Improve the economic status to tackle food access	Caregivers/parents	Loan repayment maybe a challenge because of low income
Religious group (Churches and Muslims)	Through their schools	School feeding programs	School children	-

Local Administration Chiefs	Target services to support the orphan and vulnerable children Sensitizing the community on the importance of nutrition	Cash transfers Health education and sensitization	Orphan and vulnerable children	Lack of accountability Favoritism Delay of funds Inaccessibility of the local leaders
Child protection	Cater to the needs of neglected children	-	Children	-
Women's groups	Mentor mothers on IYCF	Improve infant and young child feeding	-	-

Social Behavior Change Communication (SBCC)

The study participants reported the availability of SBCC information from different sources, which varied based on the target population. For example, SBCC information targeting caregivers of children under 5 years was obtained from either health facilities or community health volunteers. However, there were some participants who reported that they had not received any information on infant and young child feeding. The focus of SBCC among children under 5 years was infant and young child feeding and WASH.

> *"They teach us about how to breastfeed the baby from when young up to 6months and then how you will give the child food when it's time to give him/her food, such things. You are told if you want to give the child food, the first thing you should wash hands then you give. Even if you want to breastfeed the baby, you make sure you have washed your hands."* - FGD Caregivers of Children under 5

Children aged between 5 and 9 years mainly received SBCC information from schools while adolescents received information from the internet, youth groups, their school curriculum, medical camps and school clubs.

> *".....Yes very much so, very much so, it is this is incorporated in almost all subjects especially science but more so on this SBCC, this current curriculum it is basically about cleanliness, sanitation and all that so it is incorporated.... From age zero this is what is it, the preschool, yes, from age three as soon as they come to school they are introduced to this basic sanitation, yes wash your hands, brush your teeth...Cleanness, washing hands, the advantages of being clean you know, diseases that can be avoided through proper hygiene, yes, proper nutrition, exercise, yes they are given all this knowledge."* - Teacher in Korogocho School

Information provided mainly focused on different aspects of WASH and although this information was considered to be useful, there was a disconnect between what was taught in school and what was practiced at home. This was mainly attributed to lack of parental knowledge about WASH. It

was recommended that school meetings can be used as a platform to share information with parents. Other platforms used to convey information on Nutrition and WASH included media, information, education and communication (IEC) materials, church meetings, peer groups and via non-governmental organizations.

Although various SBCC platforms were identified, some the respondents felt that adolescents lacked knowledge on nutrition and WASH.

> *"I think that the main cause of all those problems is that many adolescents are not given education or awareness. There is no health awareness. As in they (adolescents) are not educated on diet and health and such things..."* - FGD Adolescents Girls and Boys

Successful and Unsuccessful Nutrition/WASH Programs

Nearly all the programs which were considered to be successful mainly focused on Nutrition. These included 1) the Malezi bora campaign, which targets pregnant mothers and children under 5 years; 2) outpatient therapeutic and supplementary feeding programs for undernourished children; 3) provision of daycare facilities by employers 4) reproductive health for adolescents; 5) school health; 6) feeding programs. The Malezi bora campaign and the therapeutic feeding programs were considered successful because of the strong referral systems which enabled caregivers and their children to access health and nutrition services. Setting up of daycare centers was considered successful because it enabled caregivers to look after their children at work, which reduced the cases of malnutrition.

Unsuccessful programs included WASH programs in schools and nutrition programs. The main reason for poor success was lack of sustainability as some of the projects would end once funding was withdrawn.

Challenges in Implementation of Programs/Intervention

The following were identified as challenges faced when implementing programs in Korogocho:

1. Limited time for programs/intervention implementation
2. Limited funds allocated for interventions

> *"Implementing the school feeding program by the school has been a challenge since the government support pulled out for lack of resources as the school is based in a low-income environment and parents are not able to adequately contribute towards this. this program therefore struggles to make ends meet and is limited in what meals it can provide to the learners."*

3. Lack of Sustainability of programs/ intervention when a donor pulls out. This was partly attributed to lack of community sensitization about their expected role in the program.

> *"It is like three years we have not been giving. We used to give them water guard and cans to put water and we show them how to prepare the water for drinking but right now we really, because of the donor fund being reduced we find ourselves stuck. What we only give is mosquito nets because that one is still there."* - KII Health Care Provider

> *"The feeding program Is not fully funded by the organizations that do it, they leave a small*

bit for the community, that is the parents, and the parents are not able to fill this gap very well in terms of the economic status… weaknesses is they are struggling when the donor is not there and to sustain is also a problem because the parents have already gotten used to the free things so telling them now to pay is a problem" – Participant in the Community Mapping

"…the community is not well sensitized on the idea that they are supposed to provide a few coins for maintenance of this project and that is what I mentioned like buying firewood and paying those people, they are not well sensitized." – Participant in the Community Mapping

4. Lack of transparency among donors in program implementation - donor driven initiatives
5. Lack of adequate space to support program implementation
6. Duplication of efforts among organizations/institutions
7. Lack of resources at household level to complement the knowledge received
8. Lack of coordination of programs, poor communication and over dependence on NGOs especially when it comes to WASH programs

"But again there is more like the school there is no…most of these kids are in school so there is no like syllabus in terms of…it is not mandatory for schools to teach the students about issues to do with nutrition and food hygiene. Not really food hygiene, but issues around WASH. So like they depend on projects which come and go, they depend on NGOs which come and go, and not all schools are so into WASH and all that. But I also think there is a gap in terms of coordination between the community and the health committee and even how they pass information, I think there is a gap. In terms of to see how they package the information to reach the age gap between 0-19. You know, how the information is packaged. I think this is a gap that has been forgotten because when you talk of nutrition and WASH issues, mostly it's about the adults. The kids are, they are vulnerable but somehow they are forgotten." - KII CAC Member

"Then of course lack of finances limits them in how many people they reach in terms of programming when it comes to nutrition and WASH. Again in terms of WASH it has been mostly left to NGOs which are few in Korogocho. The government is not doing much in terms of helping people on the ground." - KII CAC Member

9. Donors do not align their programs/interventions to community needs. They move with current trends forcing CBOs to shift their mandate to get funding

"You go for where the call is if the donors are looking for. You see there are looking at SDG 1(End poverty) then you go for now poverty you know we have to eradicate poverty so everyone is going to eradicate poverty. They forget their SDG 17 (partnership for the goals) so you know you are just moving within where there is donor funding you know. Even when someone is saying, we want to start something now there is song on global warming. Everyone is almost aligning on global warming. There is now issues on women and gender so everyone goes you know it`s like we are taken by the trend so if the current is going this way we all bend this side…So it is really a challenge that I can`t really mention (as she giggles). Some of these institutions just died off so when you are talking about girls

rights and issues so everyone will be donors are looking. You know. Supporting girls so when donors would be coming saying we want to support boy child even an institution that did not have boys in mind will start saying, you know we are recruiting boys to start an engagement with them. You know things like that so at times I will say NGOs are pathetic because they do not really align themselves to the community that they want to serve. They align themselves to donors call because in the end you have to pay your staff. You have to pay your utilities. You have to. You know so it becomes really a challenge." - Youth Group Member

10. Lack of needs assessment or community consultations before program implementation, which leads to implementation of projects which are either not relevant to the target community and are their therefore not take up

> *"Kids would say I was being supported by Action Aid they cut of you know phew like when they leave the don't give you a notice that they are leaving so it comes like with ultimatum like we are changing shifts so that up to you. So when they go to rural set ups again they are in to rural so if the ever change they would change again from shifting focus from rural to urban again it will just run dry phew and that's when there were this kiosk that they put up you know water vending because they thought that people in this area there issues was water an assumption. People made it a pig style. Quarry, a cow shed, a goat shed they are not using that is not ours. It is theirs… There was a toilet that was build it was built in Grogon and no one ever used it until it was destroyed completely and many, many other kiosks because they thought people should put in water but you have not even created the awareness around this place. You thought they would use it as a toilet how would someone go from this place to this place to come for toileting and when criminal are mugging people in this area. Who is going to use that place so it becomes a place to harbor criminals."* - Youth Group Member

11. Proper training of human resource is conducted but the implementation is poor due to lack of essential equipment/commodities to implement the training received
12. Lack of essential commodities / equipment to implement the training received

> *"[Name program] is a component for health supported by [Name organization]. So they head the WASH component on water treatment, hand wash, part of nutrition because they used to do MUAC and part of immunization. So they used to train teachers so that they are able to fill data, the teachers were trained also the field teams, so we used to work hand in hand in nutrition but they didn't provide the hardware (Hand washing kit), the school was to provide the hard ware."* – Participant in the Community Mapping

Discussion

The community case study aimed to assess nutrition and WASH vulnerabilities faced by children and adolescents in Korogocho slum, key actors, formal and informal programs currently running, and platforms used to address nutrition and WASH needs of children and adolescents. Findings from the case study showed that children and adolescents are exposed to various nutrition and WASH vulnerabilities, which have a negative impact on their nutrition status and health. This was

despite the existence of many actors and programs running in Korogocho. Most of the vulnerabilities faced were attributed to poverty, which highlights the need for more comprehensive programs, which include an aspect of poverty alleviation.

Undernutrition was common especially among children under 5 years, which is consistent with findings from quantitative studies in slums of Nairobi which report stunting rates of up to 50% (Kimani-Murage et al., 2015). Undernutrition among infants and young children was attributed to poor infant and young child feeding practices, which were attributed to lack of sufficient time for childcare as most caregivers were involved in income generating activities. Consequently, mothers opted to leave their children in day care centers but, the quality care offered in most of these centers was poor, a finding that has previously been reported (Mwase et al., 2016, Clark et al., 2018). This highlights the need for regulation of daycare centers in informal settlements so as to ensure that children receive adequate care. Strategies such as training of daycare center owners on child care and linking day care centers to community health volunteers and health facilities are likely to improve the quality of care offered in these facilities.

Ignorance and lack of proper knowledge on proper IYCF practices was also reported as a barrier to proper IYCF. Ideally caregivers of infants and young children should receive information on IYCF during routine clinic visits, but some caregivers reported that they were not aware of sources of information on IYCF. This highlights a possible gap in SBBC delivery and also possibly poor access and utilization of health facilities. Efforts should therefore be put to ensure that caregivers have access to SBBC information. Poor eating practices were also reported among adolescents and this was characterized by high intake of snack foods. Such feeding practices can be attributed to the fact that adolescents in informal settlements are considered to be adults and are therefore expected to fend for themselves (Ministry of Health et al., 2018). There is therefore a need to equip adolescents with nutrition information and knowledge to enable them to make healthy food choices.

Food insecurity was mentioned as a barrier to good nutrition which is consistent with findings from other studies which show that up to 85% of slum residents are food insecure (Kimani-Murage et al., 2014). The coping strategies reported in the current study have also been previously reported (Ministry of Health et al., 2018). These challenges highlight the need for strategies to address food insecurity in urban slums, where poverty is a major barrier to food access.

School meals appear to be an important source of nutrition among school going children, but both children and parents appear not to be satisfied with the quality and diversity of foods offered. Reviving the school feeding program in Kenya would go a long way in ensuring that school children get good nutrition, but the diversity of foods offered needs to be improved. Consumption of street foods also appeared to be common mainly because they are considered to be cheap and do not require preparation. This was despite the fact that the foods sold were not safe. Although there have been efforts by community health volunteers to promote safe and hygienic food handling, there is need for wider coverage.

Poor access to clean water, a common characteristic of informal settlements (Corburn and Hildebrand, 2015), was highlighted as a major barrier to good hygiene practices in the target

population. Although there was SBCC on hygiene as well as the infrastructure such as taps, the lack of water and soap made it impossible to put into practice information gained. This highlights the need for more comprehensive and sustainable project implementation strategies which aim to address the underlying problems. Community involvement in the design of these projects is also required so as to ensure successful implementation and sustainability. Poor access to toilets was also highlighted as a problem which led environmental contamination with fecal matter and this was associated with infectious diseases such as diarrhea and cholera. There is therefore a need to improve toilet access in schools and the in the community.

Poor access and utilization of health services was reported across all age groups and this was attributed to lack of sufficient drugs, poor client staff relationships and long waiting times. This is an indication that there is a need to improve health service delivery in informal settlements. Interventions which aim to strengthen health systems have the potential to address these some of these challenges for example Partnership for Maternal, Newborn and Child Health (PAMANECH), which aimed to assess the effect of strengthened healthcare delivery systems on the quality, accessibility, and affordability of Maternal Newborn and Child Health (MNCH) services in Korogocho and Viwandani slums, have been shown to be effective (Bakibinga et al., 2014). However, significant investment would be required for scale up and sustainability. Among adolescents, the lack adolescent-friendly health services was highlighted as a major barrier to utilization of health services which is consistent with findings from other studies (Banke-Thomas et al., 2017). There is therefore a need for demand creation for health services among adolescents. This can be achieved by having specific times when adolescents are attended to as the lack of privacy and long lines were identified as barriers to utilization.

Many programs addressing nutrition and WASH issues were identified, some of which were embedded in the existing health system. However, a key challenge identified was the lack of sustainability as programs would run for a short time due to lack of donor funding. This appeared to be common in WASH programs, which require significant investment. This highlights the need for program sustainability strategies when designing programs. There is also a need for community involvement in program design and implementation in order to ensure that the needs of the community are addressed. This will also go a long way in promoting program ownership.

Conclusions and Recommendations

Although the community case study was informative, the findings are not representative of other slums in Nairobi which have different dynamics. However, given that poverty is an underlying problem in all informal settlements, findings from this study can be used to inform the design of future studies in informal settlements. We attempted to capture information from the key target groups but we lacked detailed information from vulnerable groups such as refugees and street children. More research should therefore be targeted to these vulnerable groups. More research on nutrition status of adolescents is also required given the challenges they are facing.

Poverty is an underlying cause of nutrition and WASH challenges faced by children and adolescents in Korogocho slum. Although there are many programs currently running in this slum, some do not address the direct needs of slum residents and are therefore ineffective and

unsustainable. There is therefore a need for design and implementation of more comprehensive programs.

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