NUTRITION SURVEY CONDUCTED IN THE SLUMS OF NAIROBI COUNTY

CONCERN WORLDWIDE- KENYA

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TABLE OF CONTENTS

LIST OF FIGURES iii
LIST OF TABLES iv
ACRONYMS v
ACKNOWLEDGEMENTS vi
EXECUTIVE SUMMARY vii
Background And Key Findings vii
Methodology viii
Conclusions And Recommendations x
INTRODUCTION 11
Context Analysis 11
Rationale of Survey 12
Objectives Of Survey 13
Survey Area 13
Survey Methodology 14
Case Definition 16
RESULTS AND discussion 17
BACKGROUND INFORMATION 17
Response Rate 17
Gender of the children in the survey 17
Caregivers' level of education 17
Marital Status 18
Households' main source of income and livelihood 18
NUTRITION STATUS OF CHILDREN 20
Prevalence of acute malnutrition (weight-for-height z-score –WHO Standards 2006) 20
Nutrition status by sub county 21
Prevalence of Acute malnutrition by MUAC 21
prevalence of underweight 22
Prevalence of stunting 22
Maternal Nutrition Status 23
ACCESS AND UTILIZATION OF HEALTH AND NUTRITION SERVICES 25
Vitamin a supplementation 25
Micro nutrient Powders (Infants and young children aged 6–23 months) 25
Child Immunizations 26
Morbidity 27
Health Seeking Behavior 27
WATER AND SANITATION 29
Main source of water 29
Access of water and Sanitation Facility 30
Water Treatment and Hand washing 31
Payment and Water Storage 32
Ownership of mosquito net 32
Maternal NUTRITION 33
Iron Supplementation 33
FOOD SECURITY 34
Women Dietary Diversity (24-Hour Recall) 34
Minimum Dietary Diversity for Women 35
Household Dietary Diversity (7 days Recall) 36
Minimum Household Diversity 36
Micronutrient Consumption From Household Dietary Diversity 36
Food Consumption Score 38
Food Consumption Score _Nutrition 39

Food Fortification 39
Coping Strategy Index 40
CONCLUSIONS AND RECOMMENDATIONS 42
APPENDICIES 43
Appendix 1: Plausibility Results 43
Appendix 2: Calendar Of Local Events 44
APPendix 3: Clusters visited 45
Appendix 4: Questionnaires 46

LIST OF FIGURES

Figure 1: Admission trends from Jan 2016 to April 2017 for OTP and SFP Program *13*
Figure 2: Caregivers' Level of Education *17*
Figure 3: Marital Status *18*
Figure 4: VITAmin A supplementation (6-59 months) and Deworming coverage (12-59 months) *25*
Figure 5: Measles and OPv1 and opv3 coverage *26*
Figure 6: child morbidity *27*
Figure 7: Health seeking behaviour *28*
Figure 8: Main SOURCE OF water *29*
Figure 9: Sanitation facility *31*
Figure 10: Mosquito net ownership *33*
Figure 11: IFAS supplementation *33*
Figure 12: women dietary diversity *34*
Figure 13: minimum wdd score *35*
Figure 14: Household dietary diversity *36*
Figure 15: household consumption of micro nutrients rich foods *37*
Figure 16: average number of days of consumption of micronutrient rich foods *37*
Figure 17: household food consumption *38*
Figure 18 : frequency of consumption of protein, vitamin a and iron hem rich foods *38*
Figure 19: food consumption score _nutrition *39*
Figure 20: food fortification and source of maize flour *40*

LIST OF TABLES

Table 1: Summary of Key Findings ..... *viii*
Table 2: Sample Size parameters *15*
Table 3: Cluster Distribution *15*
Table 4: Reason for being not in School *18*
Table 5: Households' Main source of INCOME & occupation *18*
Table 6: Prevalence of Acute Malnutrition Based On Weight-For-Height Z-Scores (and/or Oedema) and by Sex *20*
Table 7: Nutrition status by sub county *21*
Table 8: Prevalence of Acute Malnutrition Based On MUAC (and/or Oedema) *21*
Table 9: Prevalence of Underweight Based on Weight-For-Age *22*
Table 10: Prevalence of Stunting Based on Height-For-Age *23*
Table 11: Maternal nutrition status using MUac *24*
Table 12: diarrhoea cases *27*
Table 13: WATER CONSUMPTION *30*
Table 14: Trekking distance and queuing for water *30*
Table 15: handwashing at critical times *31*
Table 16: Water storage and payment for water *32*
Table 18: minimum hdd score *36*
Table 19: COPING STRATEGY INDEX *41*

ACRONYMS

AMTSL:	Active Management of Third Stage of Labor
ANC:	Antenatal Care
APHRC:	African Population Health Research Centre
BCG:	Bacillus Calmette – Guerin
BFCI	Baby Friendly Community Initiatives
CHW	Community Health Workers
CHEW	Community Health Extension Workers
C.I.:	Confidence Interval
DMOH:	District Ministry of Health
DNO:	District Nutrition Officer
DPT:	Diphtheria, Pertussis and Tetanus
EBF:	Exclusive Breastfeeding Rate
ENA:	Emergency Nutrition Assessment
FTC:	Feed the Children
GAM:	Global Acute Malnutrition
HiNi:	High Impact Nutrition Intervention
IMR:	Infant Mortality Rate
IYCN:	Infant and Young Children Nutrition
KPC:	Knowledge, Practice and Coverage
MAM:	Moderate Acute Malnutrition
MIYCN:	Maternal Infant and Young Children Nutrition
MNCH:	Maternal and New-Born Child Health
MoH:	Ministry of Health
MoH:	Ministry of Health
MUAC:	Mid-Upper Arm Circumference
SAM:	Severe Acute Malnutrition
SMART:	Standardized Measurement of Relief and Transition
SPSS:	Statistical Package for Social Sciences
TBA:	Traditional Birth Attendants
UNICEF:	United Nations Children Fund
VAD:	Vitamin A Deficiency
WFA:	Weight for Age
WFH:	Weight for Height
WHO:	World Health Organization

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EXECUTIVE SUMMARY

BACKGROUND AND KEY FINDINGS

Concern Worldwide has been supporting the Ministry of Health (MoH) in the improvement of health and survival of children under five and pregnant and lactating women through support to health and nutrition systems to scale up high impact nutrition interventions[1] (HINIs). Initially, the program was covering only three districts but later the program has been expanded to cover nine sub counties out of the ten Sub counties in Nairobi County. This survey was, proposed after February 2017 KFSSG report Nairobi County was rated second highest county in Estimated Caseloads for Children 6-59months that Require Treatment for Acute Malnutrition and Urban Early Warning and Early Action (UEWEA) program in the month of March 2017, household food insecurity was at its lowest.

The survey findings indicated a GAM prevalence rate of 4.6% (3.4 - 6.3 95% C.I.), with a caseload of 23,791 cases while the prevalence for severe malnutrition was 0.1 % (0.0 - 0.9 95% C.I.). This is generally classified as normal by the WHO classification of malnutrition. However, going by the number of cases of malnourished children in Nairobi County, there is need of urgent concern and concentered efforts to tackle malnutrition. The findings also showed the prevalence of underweight at 11.4 % (8.8 - 14.7 95% C.I.) where 1.7 % (1.0 - 2.7 95% C.I.) were severely underweight. In terms of stunting prevalence, the survey findings indicated that 26.1 % (22.9 - 29.5 95% C.I.) of children in Nairobi County were malnourished as where 7.7 % (6.0 - 9.8 95% C.I.) of the children were severely stunted. Further analysis of the nutrition data showed that Kamukunji (Kiambio/ Majengo) and Dagoretti (Kawangware/Gatina had the highest prevalence of malnutrition (wasting) at 9.6% and 9.2% respectively. In terms of stunting, Ruaraka (Korogocho) had the highest prevalence at 31.8% while Kamukunji (Kiambio/ Majengo had the highest prevalence of underweight cases at 21.2%.

The survey findings indicated that 46.1% (391) of children aged 0-59 months in Nairobi County was reported to have been ill two weeks prior to survey. The most prevalent illness during this period was acute respiratory illnesses/ cough at 44.5%, fever with chills (35.5%) and watery diarrhea (24.6%). In term of supplementation, the survey findings indicate that the overall proportion of children (12-59 Months) supplemented with Vitamin A for at least 2 times in the period of one year preceding the survey was 49.9% which is way below the national target of 80%. In terms of zinc supplementation or oral rehydration salts (ORS), 76% had received the supplementation which is below the HiNi target of 80%. From the survey results, 97.3% (n=799) of children were reported to have received BCG and confirmed by Scar while Measles vaccination coverage at 9 months was at 97%. In addition, 80.1% (313) of children in Nairobi County sought Health assistance when their children were ill. In terms of the specific areas sought for the treatment, majority sought assistance from private clinics and public clinics (40.6%). Additionally, the results of the survey showed that 51.8% (n=496) of the households reported treating water before drinking. The results of the survey showed that among the caregivers interviewed 18.7 (n=161) reported practicing proper hand washing at the 4 critical times. The survey results also showed that in terms of mosquito net ownership, 66.2% of the households in Nairobi County owned them. For the household dietary diversity, analysis showed that only 0.2% of the households consumed less than 3 food groups while the women dietary diversity showed that 31.4% of the women aged 15-49 years consumed less than 5 food groups. Lastly, the survey results showed that the total weighted coping strategy score was 13.07.

The survey was conducted through the partnership of the Ministry of Health, Feed the Children and Concern Worldwide and was funded by UNICEF. The survey was conducted between 2nd May and 13th May, 2017.

[1] The 11 HINI include breastfeeding promotion, complementary feeding for infants after the age of six months, improved hygiene practices including: hand washing, vitamin A supplementation, zinc supplementation for diarrhea management, de-worming, iron-folic acid supplementation for pregnant women, salt iodization, iron fortification of staple foods, prevention of moderate under nutrition and treatment of acute malnutrition.

METHODOLOGY

The target geographical area was the slums in Nairobi County. Specifically, the survey covered the following slums; Makadara(Viwandani), Embakasi East(Mukuru), Lan'gata (Kibera), Westlands(Githogoro/Kibarage), Dagoretti(Kawangware/Gatina), Ruaraka(Korogocho), Kasarani(Gitare), Starehe(Mathare), Embakasi West(Kayole Soweto), Kamukunji(Kiambio/ Majengo)

Due to the complex nature of the urban population; the survey adopted a 3 stage sampling technique. A mapping of all the slums was done before the survey which was meant to provide the distribution of households in each slum. After the mapping was done, the slums were segmented into block of approximately 1000 households. With the list of the blocks for all the slums, then the selection of the blocks to be included in the survey was selected using the simple random sampling which was the 1st stage sampling. The sampled blocks were then segmented into enumeration areas of approximately 100 households where which was the primary sampling unit for this survey. The selection of the enumeration areas was the 2nd stage sampling and this was done using the simple random sampling. Finally, with the sampled enumeration areas, a list of all households with children between 6 and 59 months was drawn upon which 13 households was sampled using simple random sampling.

OBJECTIVES OF THE SURVEY

- The overall objective of the survey is to determine the nutrition status of children aged 6- 59 months old and Women of reproductive age 15-49 Years in the slums of Nairobi County. Specific objectives of the baseline survey:
- To estimate the current prevalence of acute malnutrition in children aged 6 – 59 months
- To estimate the nutritional status of women of reproductive age 15-49 years using MUAC measurements.
- To estimate Measles, de-worming, BCG vaccination and 'Vitamin A' supplementation coverage for children 9-59 months and 6-59 months respectively
- To establish the Morbidity rates of children 6-59 months 2 weeks prior to the survey.
- To collect information on household food security, water, sanitation, and hygiene practices.

The following table presents the summary of the indicators

TABLE 1: SUMMARY OF KEY FINDINGS

	May 2017		
	All (n = 840)	**Boys (n = 407)**	**Girls (n = 433)**
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(39) 4.6 % (3.4 - 6.3 95% C.I.)	(23) 5.7 % (3.6 - 8.7 95% C.I.)	(16) 3.7 % (2.2 - 6.0 95% C.I.)
Caseload	23,791		
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(1) 0.1 % (0.0 - 0.9 95% C.I.)	(1) 0.2 % (0.0 - 1.8 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)
Caseload	517		
Prevalence of global malnutrition by MUAC (< 125 mm and/or oedema)	(22) 2.6 % (1.5 - 4.3 95% C.I.)	(9) 2.2 % (1.0 - 4.6 95% C.I.)	(13) 2.9 % (1.5 - 5.5 95% C.I.)
Prevalence of severe malnutrition by MUAC (< 115 mm and/or oedema)	(3) 0.3 % (0.1 - 1.1 95% C.I.)	(1) 0.2 % (0.0 - 1.8 95% C.I.)	(2) 0.5 % (0.1 - 1.8 95% C.I.)
Prevalence of underweight (<-2 z-score)	(96) 11.4 % (8.8 - 14.7 95% C.I.)	(49) 12.0 % (8.6 - 16.6 95% C.I.)	(47) 10.8 % (7.6 - 15.1 95% C.I.)
Prevalence of severe Underweight (<-3 z-score)	(14) 1.7 % (1.0 - 2.7 95% C.I.)	(10) 2.5 % (1.4 - 4.3 95% C.I.)	(4) 0.9 % (0.3 - 2.4 95% C.I.)
Prevalence of Stunting (<-2 z-score)	(214) 26.1 % (22.9 - 29.5 95% C.I.)	(113) 28.3 % (23.7 - 33.5 95% C.I.)	(101) 23.9 % (20.6 - 27.6 95% C.I.)

Prevalence of severe stunting (<-3 z-score)	(63) 7.7 % (6.0 - 9.8 95% C.I.)	(35) 8.8 % (6.2 - 12.2 95% C.I.)	(28) 6.6 % (4.5 - 9.6 95% C.I.)

Category	**Indicator**	**Nairobi County**		
		n	**N**	**%**
Immunization /Vaccination and supplementation	Deworming (12-59 Months)	476	731	65.1%
	Measles at 9 Months (Yes by Card)	479	795	60.3%
	Measles at 9 Months (Yes by Recall)	292	795	36.7%
	Measles at 18 Months (Yes by Card)	284	593	47.9%
	Measles at 18 Months (Yes by Recall)	213	593	35.9%
	BCG by Scar	799	848	94.2%
	OPV 1 (Yes by Card)	534	848	63.0%
	OPV 1 (Yes by Recall)	308	848	36.3%
	OPV 3 (Yes by Card)	516	848	60.8%
	OPV 3 (Yes by Recall)	303	848	35.7%
Supplementation	Zinc Supplementation	73	96	70.0%
	Vitamin A Supplementation (12-59 Months) - Once	586	731	80.2%
	Vitamin A Supplementation (6-11 Months)- Once	102	117	87.2%
	Vitamin A Supplementation (6-11 Months)- Once verified by card	81	117	69.2%
	Vitamin A Supplementation (12-59 Months) - Twice	365	731	49.9%
	Vitamin A Supplementation (12-59 Months) - Twice (Verified by Card)	263	731	36.0%
	Vitamin A Supplementation (6-59 Months) - Once	686	848	80.9%
Morbidity	Prevalence of Fever	139	391	35.5%
	Prevalence of ARI	174	391	44.5%
	Prevalence of Watery Diarrhea	96	391	24.6%
	Prevalence of Bloody Diarrhea	4	391	1.0%
Health Seeking behavior	Health Seeking Behavior	313	391	80.1%
Hygiene				
Household Which wash Hands			860	89.9%
After Toilet			805	93.6%
Before cooking			416	49.5%
Before Eating			714	83.0%
After taking children to the toilet			286	33.3%
Hand washing by Soap and water			741	86.2%
hand washing 4 critical times			161	18.7%
Total weighted Coping Strategy Score				13.07

CONCLUSIONS AND RECOMMENDATIONS

The survey concluded that the nutrition situation in the slums is normal according to the World Health Organization classification of malnutrition. However, going by the high number of cases of malnourished children in Nairobi County, there is need of urgent concern and concerted efforts to tackle malnutrition from both the Government and implementing partners. Further, according to the survey, the stunting rates in the slums are classified as high according to the World Health Organization classification of stunting. The survey also noted that the coverage of maternal, neonatal, child health and nutrition indicators were average and required more context specific interventions to address the multi-faceted causes of malnutrition e.g. implementation of baby friendly community initiatives (BFCI), training of health workers and extension workers. In addition, the household food security situation in the slums was poor due to current inflation and looming famine in other parts of the country. This calls for an integrated approach in the implementation of nutrition, health and food security interventions to ensure optimal impact on the current situation. In addition the current interventions on food fortification and micronutrient powders supplementation need to be scaled up through utilizing the existing community mobilization channels (e.g. community units) and innovate better ways to create more awareness of the nutritious products in the County. In terms of improving the poor WASH indicators and reduce the increased diarrheal cases, scale-up of continuous health education on water treatment, handwashing as well as distribution of water purification products is required.

This calls for public-private partnerships with all the stakeholders supporting health and nutrition interventions in Nairobi City County. Such partnerships will go a long way in improving the overall health, nutrition and food security situation in Nairobi County.

INTRODUCTION

CONTEXT ANALYSIS

More than half of Kenya's urban slum residents live in poverty[2]; they dwell in peripheral urban informal settlements on meagre incomes in unsanitary and overcrowded conditions. This is particularly so for the urban poor living in Nairobi's city slums. Slum dwellers in Nairobi reside on only 5% of the land but comprise 60% of the city's population[3]. These locations are complex. Economic, social and governing structures are more complicated than rural localities; they also contain fragmented, less cohesive communities[4.] Slum conditions create greater exposure to violence (often sexual and gender based), unwanted pregnancy and adverse health and nutrition outcomes, particularly for women and their children. Maternal and child outcomes are intimately linked. Poor maternal health affects the development of the fetus, the likelihood of a healthy pregnancy and birth outcomes. Maternal caring practices, including sub optimal maternal, infant and young child nutrition (MIYCN) practices from gestation up to two years of life, also contribute to poor and often irreversible child health outcomes. Poor nutrition in mothers and young children leave both vulnerable to opportunistic infections and diseases such as diarrhea, malaria and acute lower respiratory infections.

The rate of urbanization in Kenya is one of the highest in the world. Over half of urban populations live in slum areas, with one in three children or 1.7 million children living in poverty. The urban population growth is estimated at 5% annually over the last decade compared to the average population growth of Sub Saharan Africa that is estimated at 2.3%. Over 60% of the urban population in Kenya lives in slums[5]; the slum dwellers in Nairobi reside on only 5% of the land. Evidence from the first ever Cross-Sectional Slum Survey conducted in Nairobi (NCSS) by APHRC in 2000 revealed that slum residents have the worst health outcomes of any group in Kenya (including rural residents); they have limited access to basic facilities such as water and sanitation, or opportunities for life such as education and employment, and that they endure the complete absence of the public sector and law enforcement agencies in their daily lives. There are increasing numbers of 'food poor', those unable to meet all nutritional needs due to expenditure on other basic non-food essentials, and 'hard core poor', who cannot meet their minimum food requirements even if they allocate all their income on food[6]with the poorest urban-dwellers spending up to 75% of their income on staple foods alone.

Urban informal settlements, the location of most malnutrition, are complicated; they contain fragmented, less cohesive communities than their rural counterparts.[7] Informal settlement dwellers are mobile, moving between urban and rural settings and within urban localities. Within these environments, the dynamic inter-linkages between migration, poverty and health are not fully understood.[8] With chronic unemployment and under employment slum populations are highly vulnerable to shocks, from price increases to disease outbreaks and political unrest, the consequences of which are a high disease burden, food insecurity, and ultimately high levels of malnutrition and mortality.

In most cases, urban populations rely on markets for all their goods, services and employment and are very vulnerable to any unfavorable changes in the market system. Food markets in poor urban areas tend to be inefficient in terms of providing adequate quantities, quality and competitive. (Martine et al., 2012).

[2] UN Habitat, 2010, State of African Cities.
[3] UN Habitat, 2007, Kenya Slum Upgrading Programme.
[4] Zulu, E.M., Beguy, D., Ezeh, A.C., Bocquier, P., Madise, N.J., Cleland, J. and J. Falkingham, 2011, *Urbanisation, Poverty, and Health Dynamics in sub-Saharan Africa: Insights from Nairobi Slum Settlements,* Journal of Urban Health, Bulletin of the New York Academy of Medicine, Vol 88, Supplement 2.
[5]Nairobi Urban Sector Profile, 2006
[6]OXFAM, 2009. Urban Poverty and Vulnerability in Kenya
[7] Zulu, E.M., Beguy, D., Ezeh, A.C., Bocquier, P., Madise, N.J., Cleland, J. and J. Falkingham, 2011, *Urbanisation, Poverty, and Health Dynamics in sub-Saharan Africa: Insights from Nairobi Slum Settlements,* Journal of Urban Health, Bulletin of the New York Academy of Medicine, Vol 88, Supplement 2.
[8]Ibid.

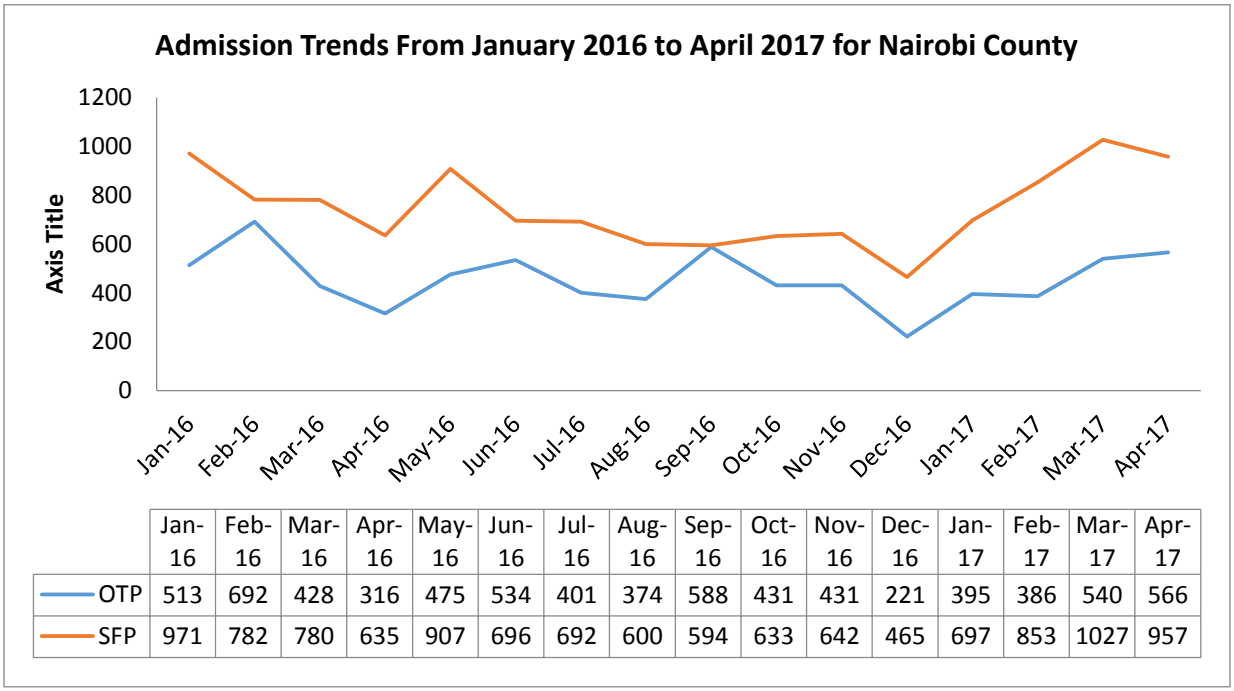
In urban households including information settlements, there is a tendency to consume foods with a greater energy density with potentially fewer micronutrients. This is leading to the 'double burden' of malnutrition whereby overweight and obesity co-exist with undernutrition. Households where overweight adults and underweight children co-exist are increasingly common in some developing countries. According to the 2014 proPAN study, micronutrient deficiencies were found in Viwandani where 72% of children were on Vitamin A supplements. The study also mentioned the existence of multivitamin, mineral supplement and micronutrient powder programs in the same community. The presences of this program in the study area are a pointer of micronutrient deficiency. In low resource settings, supplementary food is often nutritionally inferior. Recent surveys have shown that between 70 and 75% of slum dwellers are poor with limited access to water and sanitation, compared to 46% of the national population as a whole.

The conditions in which the urban poor live in predispose them to poor health, these include poor hygiene and sanitation, poor environmental sanitation, poor housing, and low income levels. There is a high prevalence of communicable diseases such as TB, diarrhoea, malaria and other water borne diseases, contributing to high levels of malnutrition. This is in addition to poor maternal health and rates of HIV which are estimated at double the national average. The high rate of maternal mortality in the slums is associated with pregnancy complications arising from anaemia, maternal morbidity and low weight in pregnancy, all closely linked to malnutrition. More than half the pregnant women in Kenya are iron deficient (KDHS, 2008/09).

RATIONALE OF SURVEY

The survey was, proposed after February 2017 KFSSG report Nairobi County was rated second highest county in Estimated Caseloads for Children 6-59months that Require Treatment for Acute Malnutrition. In addition, according to data collected by the Urban Early Warning and Early Action (UEWEA) program in the month of March 2017, household food insecurity was at its lowest. Inflation rates have increased significantly among urban dwellers and most affected populations will be people living in the slums thus the survey will help determine the extent of the effects of inflation on food security. Drought has hit the ASAL area which was declared an emergency by the National Government and there is a high likelihood for food insecurity situation to also affect the urban dwellers too.

Also looking at the admission trends of January 2016 to April 2017 there is a trend of rise in number of cases in the program both Outpatient Therapeutic Program and Supplementary Feeding Program especially from the Month of January 2017 to April 2017.



	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17
OTP	513	692	428	316	475	534	401	374	588	431	431	221	395	386	540	566
SFP	971	782	780	635	907	696	692	600	594	633	642	465	697	853	1027	957

FIGURE 1: ADMISSION TRENDS FROM JAN 2016 TO APRIL 2017 FOR OTP AND SFP PROGRAM

Therefore, the information collected will form part of the routine surveillance of the nutrition situation in the county. The information to be collected will inform nutrition programming in the County and the information collected will help in tracking progress/success of the nutrition interventions put in place since the last survey in 2014.The information collected will be used in updating the County situation analysis.

OBJECTIVES OF SURVEY

- The overall objective of the survey is to determine the nutrition status of children aged 6- 59 months old and Women of reproductive age 15-49 Years in the slums of Nairobi County. Specific objectives of the baseline survey:
- To estimate the current prevalence of acute malnutrition in children aged 6 – 59 months
- To estimate the nutritional status of women of reproductive age 15-49 years using MUAC measurements.
- To estimate Measles, de-worming, BCG vaccination and 'Vitamin A' supplementation coverage for children 9-59 months and 6-59 months respectively
- To establish the Morbidity rates of children 6-59 months 2 weeks prior to the survey.
- To collect information on household food security, water, sanitation, and hygiene practices.

SURVEY AREA

The target geographical area was the slums in Nairobi County. Specifically, the survey covered the following slums; Makadara(Viwandani), Embakasi East(Mukuru), Lan'gata (Kibera), Westlands(Githogoro/Kibarage), Dagoretti(Kawangware/Gatina), Ruaraka(Korogocho), Kasarani(Gitare), Starehe(Mathare), Embakasi West(Kayole Soweto), Kamukunji(Kiambio/ Majengo).

SURVEY METHODOLOGY

SURVEY DESIGN

The survey adopted a three stage cluster sampling. The 1st stage was the selection of blocks using Simple Random Sampling (SRS) (All the target slums will be divided into block of approximately 1000 HHs per block). The 2nd stage sampling was the selection of segments which will be considered to be the clusters and this will be done using SRS (The sampled blocks will further be segmented into 10 segments of approximately 100 HHs per segment). The third stage sampling was the selection of households from the sampled segments which will be done through SRS (All households from the sampled segments will be listed from which the households will be sampled). In the sampled households, all children aged between 6 and 59 months will be taken their anthropometric measurements. (The photo below shows an example of the blocking as done in the slums. The white lines show the blocks boundaries while the yellow lines shows the village boundaries in the slum.)

Korogocho slums

Mukuru slums

Due to the complex nature of the urban population; the survey adopted a 3 stage sampling technique. A mapping of all the slums was done before the survey which was meant to provide the distribution of households in each slum. After the mapping was done, the slums were segmented into block of approximately 1000 households. With the list of the blocks for all the slums, then the selection of the blocks to be included in the survey was selected using the simple random sampling which was the 1st stage sampling. The sampled blocks were then segmented into enumeration areas of approximately 100 households where which was the primary sampling unit for this survey. The selection of the enumeration areas was the 2nd stage sampling and this was done using the simple random sampling. Finally, with the sampled enumeration areas, a list of all households with children between 0 and 59 months was drawn upon which 13 households was sampled using simple random sampling. This was the third stage sampling.

STUDY POPULATION

The target population for this survey will be the children aged 6 – 59 months and the women of reproductive age 15-49 years.

ANTHROPOMETRIC SAMPLE SIZE

The anthropometric survey sample size was calculated using the SMART survey calculator. The parameters of interest were captured in the ENA July 2015 software and the respective number of children required for the survey computed as indicated below.

SAMPLE SIZE CALCULATION

TABLE 2: SAMPLE SIZE PARAMETERS

Parameter	Value	Source/Rationale
Estimated Prevalence (Wasting)	7.6%	2014 Nairobi slums Nutrition Survey(Concern)
Precision	2.6	From SMART Global project
Design Effect	1.2	To cater for heterogeneity that may arise
Children to be included in Sample	521	
Average Household Size	4.3	2014 Nairobi slums Nutrition Survey(Concern)
Population of Under-5	15.6%	DHIS
Non-Response Rate	5%	To cater for the non-response
Households to be included	909	

The overall sample size for this survey was 909 children. In the sampled households, anthropometric measurements for children aged between 6 and 59 months were taken. In total, there will be 70 clusters which will be sampled and in each cluster/segments, 13 Households will be sampled as shown in the table below:

TABLE 3: CLUSTER DISTRIBUTION

Slum	Population Proportion	Number Of Cluster
Korogocho	5.9%	4
Majengo/Kiambio	5.3%	4
Mathare	16.9%	12
Gitare Marigu	6.0%	4
Viwandani	6.3%	4
Mukuru	18.3%	13
Githogoro/Kibarage	5.1%	4
Kawangware/Gatina	4.2%	3
Kibera	20.7%	15
Kayole Soweto	11.1%	8
Total	**100.0%**	**70**

ORGANIZATION OF THE SURVEY

Coordination/Collaboration: Before the survey was conducted meetings were held with key stakeholders and briefed them about the purpose, objectives and methods for the survey. This included validation of the methodology at the National Nutrition Information Working Group, briefing the County Health Management Team, liaising with the Sub-County Health Management Team, and working closely with the SCNOs and Sub County Community Health Strategy Focal persons.

Training of the Survey Team: The data collection teams were given 4-days training prior to field work, including a standardization test to ensure standardization of measurement and recording practice. All data collectors were trained on taking anthropometric measurements, completion of questionnaires and

sampling methodology. The data collection forms and questionnaires were pilot tested in clusters not selected to be part of the larger survey, to ensure that the interviewers and respondents understand the questions and that interviewers follow correct protocols. The teams were also trained on the digital data collection methods as tablets were used during the survey.

Team work in the field: Ten Teams each with three members who had experience in data collection were recruited from the survey area with each team consisting of 1 Team Leader and 2 Measurers. In addition, 5 supervisors with extensive knowledge of Surveys were recruited in order to oversee the execution of the survey at the field level. The Survey Supervisors were the SCNOs; there were also three overall Survey Coordinators, the consultant, and one from Feed the Children (FEED) and one from Concern Worldwide. Finally, the movement from one sampled household to another in every enumeration areas was facilitated by the Community Health Volunteers (CHVs) who were seconded by the Sub County Community Strategy Focal persons and the CHAs.

CASE DEFINITION

The Global Acute Malnutrition (GAM) is the index which is used to measure the level of wasting in any given population. In this survey, GAM was defined as the proportion of children with a z-score of less than -2 z-scores weight-for-height and/or presence of bilateral edema. Severe Acute Malnutrition (SAM) was defined as the proportion of children with a z-score of less than -3 z-score and/or presence of oedema. Further, using the mid-upper arm circumference (MUAC), GAM was defined as the proportion of children with a MUAC of less than 125 mm and/or presence of edema while SAM was defined as the proportion of children with a MUAC of less than 115 mm and/or presence of edema.

Malnutrition by Z-Score: WHO (2006) Standard

- Severe acute malnutrition is defined by WFH < -3 SD and/or existing bilateral oedema on the lower limbs
- Moderate acute malnutrition is defined by WFH < -2 SD and >-3 SD and no oedema
- Global acute malnutrition is defined by WFH < -2 SD and/or existing bilateral oedema

Malnutrition by MUAC

- Severe malnutrition is defined by MUAC<115 mm and/or presence of bilateral oedema
- Moderate malnutrition is defined by MUAC < 125 mm and ≥115 mm and no oedema
- Global acute malnutrition is defined by MUAC <125 mm and/or existing bilateral oedema

QUESTIONNAIRE

The survey adopted the data collection tools recommended in the Nutrition Information Working Group.

DATA ANALYSIS

Data Analysis: The data entry and analysis was done using ENA for SMART (July, 2015 Version). Further analysis was done with SPSS version 20 and Ms. Excel. Daily quality of data was monitored through running the plausibility results for the anthropometric data and results were feedback to the team on every morning before leaving for the field.

RESULTS AND DISCUSSION

BACKGROUND INFORMATION

RESPONSE RATE

The targeted households for this survey were 909 households with children aged between 6 and 59 which also included a 5% non-response rate. However, 957 households were sampled which implies that the sample was greater by 5.2% than planned. The sample was greater than the expected because of insecurity in the slums hence fear not to reach the daily target which led to increasing the daily target to 14 households per day. Out of the sampled households, 860 had children aged between 6 and 59 months.

GENDER OF THE CHILDREN IN THE SURVEY

Overall, anthropometric measurements of 840children were taken with 407 being boys and 433 being girls. The sex ratio was 0.94 and was within the recommended range of 0.8 to 1.2 and hence the sample was unbiased for gender.

CAREGIVERS' LEVEL OF EDUCATION

As shown in the figure below, nearly 46.9% of caregivers in the slums of Nairobi were primary school education holders while 44.4% were secondary school holders. It's also worth noting that 1.0 % of the caregivers in the slums had no formal education while 1.2% had pre-primary education.

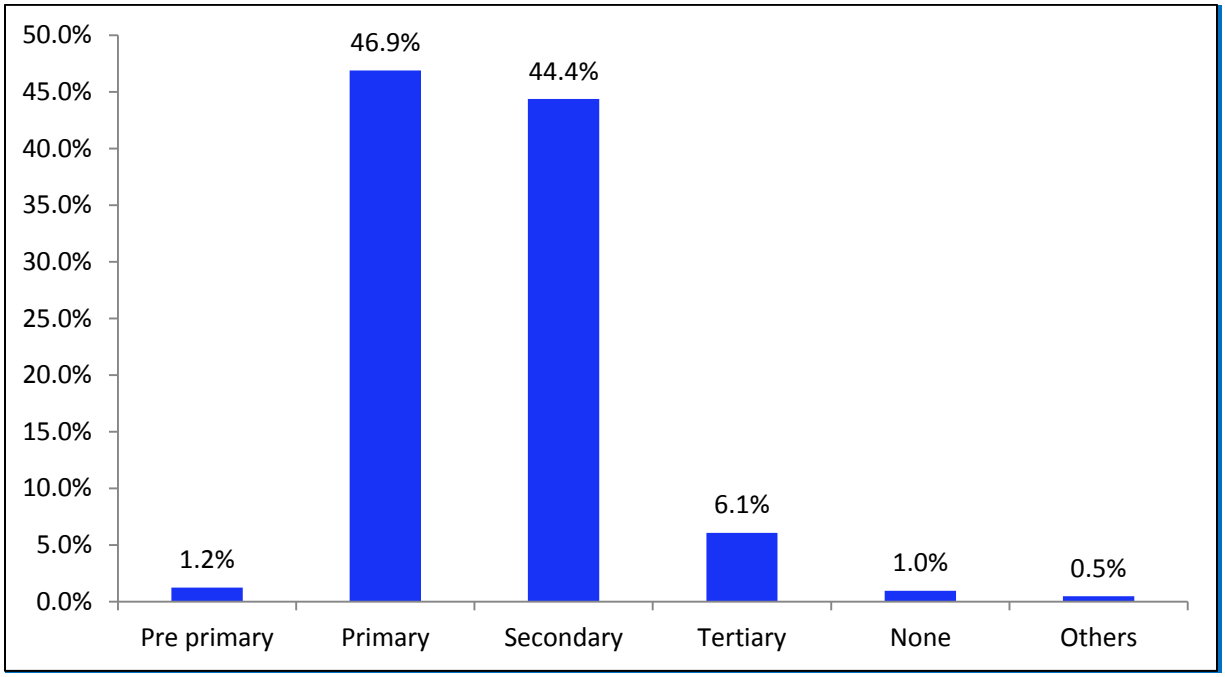


FIGURE 2: CAREGIVERS' LEVEL OF EDUCATION

Among ages 3 years to 18 years 86.7% were enrolled in schools and 13.3% not enrolled and sighted that fees or cost was the major reason for not being in school at 22.1% (32) followed by Chronic Sickness at 7.6% (11).

TABLE 4: REASON FOR BEING NOT IN SCHOOL

Reason For being not in School	n	%
Chronic Sickness	11	7.6%
Weather	3	2.1%
Family Labor responsibilities	2	1.4%
Fees or Cost	32	22.1%
Household doesn't see value of schooling	2	1.4%
No school nearby	1	0.7%
Married	2	1.4%
Migrated/moved from schools area	3	2.1%

MARITAL STATUS

The survey results show that 82% of the caregivers interviewed were married with only 12.7% reporting that they were single.

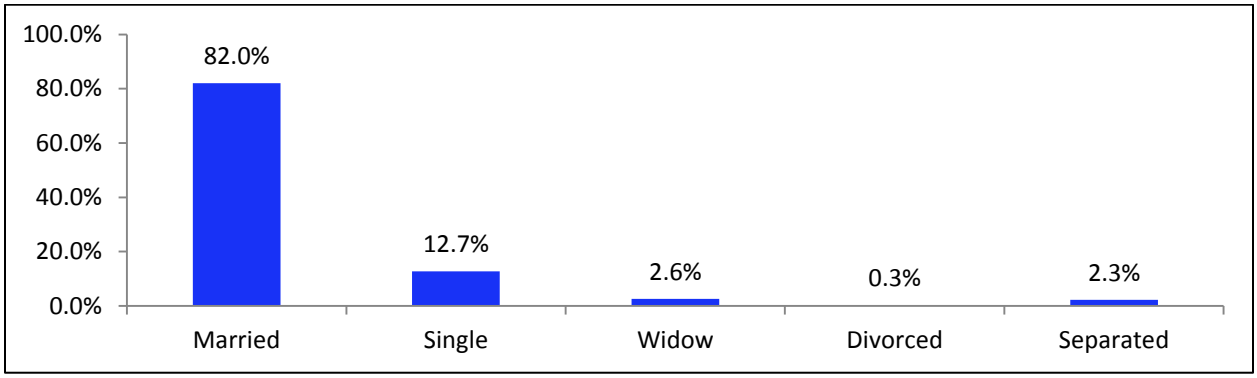


FIGURE 3: MARITAL STATUS

HOUSEHOLDS' MAIN SOURCE OF INCOME AND LIVELIHOOD

The livelihood of most inhabitants of Nairobi comes from informal economic activities, and formal wage employment has been decreasing, as the public sector continues to retrench its employees. The informal sector where most of the poor belong has been noted to generate more employment than the formal sector[9] .

From the survey the main source of livelihood in the slums was casual labor reported by 53.4% (511) and this was followed by employed reported by 18.9% and petty trade at 12.3% while the main source of income in slums of Nairobi for the period of 30 days prior to the survey was casual labor reported by 44.6% of the households followed by petty trading at 13.0% and permanent job at 10.8%. The below results are indicative that the main source of income in the urban slums remains to be casual labor.

TABLE 5: HOUSEHOLDS' MAIN SOURCE OF INCOME & OCCUPATION

Indicator	Category	n	%
Main Occupation	Employed	181	18.9%
	Casual labor	511	53.4%

[9] http://www.ucl.ac.uk/dpu-projects/Global_Report/pdfs/Nairobi.pdf

	Petty trade	118	12.3%
	Merchant/Trader	46	4.8%
	Firewood/Charcoal	2	0.2%
	Fishing	1	0.1%
	Others	98	10.2%
Source of income	No income	174	18.2%
	Sale of livestock	1	0.1%
	Sale of livestock products	3	0.3%
	Sale of crops	10	1.0%
	Petty trading	124	13.0%
	Casual labor	427	44.6%
	Permanent Job	103	10.8%
	Sale of Personnel assets	14	1.5%
	Remittance	3	0.3%
	Income earned by Children	3	0.3%
	Others	95	9.9%

NUTRITION STATUS OF CHILDREN

PREVALENCE OF ACUTE MALNUTRITION (WEIGHT-FOR-HEIGHT Z-SCORE – WHO STANDARDS 2006)

In this survey, the global acute malnutrition (GAM) is defined as the proportion of children with a z-score of less than -2 z-scores weight-for-height and/or presence of edema. Additionally, severe acute malnutrition (SAM) is defined as the proportion of children with less than -3 z-scores weight-for-height and/or presence of edema.

TABLE 6: PREVALENCE OF ACUTE MALNUTRITION BASED ON WEIGHT-FOR-HEIGHT Z-SCORES (AND/OR OEDEMA) AND BY SEX

	All n = 840	**Boys** n = 407	**Girls** n = 433
Prevalence of global malnutrition (<-2 z-score and/or edema)	(39) 4.6 % (3.4 - 6.3 95% C.I.)	(23) 5.7 % (3.6 - 8.7 95% C.I.)	(16) 3.7 % (2.2 - 6.0 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(38) 4.5 % (3.3 - 6.2 95% C.I.)	(22) 5.4 % (3.4 - 8.4 95% C.I.)	(16) 3.7 % (2.2 - 6.0 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(1) 0.1 % (0.0 - 0.9 95% C.I.)	(1) 0.2 % (0.0 - 1.8 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)

The overall GAM Rate in the slums was 4.6% (3.4 – 6.3, 95% CI) which is indicative of an acceptable[10] nutrition status in the area based on the WHO classification of GAM. The prevalence of SAM among the children aged 6 to 59 months in Slums was found to be 0.1% based on the WFH and/or edema. The SAM rate is considered normal based on the WHO[11] classification of SAM. The boys (5.7%) were slightly affected by malnutrition when compared with the girls (3.7%), although the difference was not statistically significant. The prevalence of edema was found to be 0.1% (n=1).

When compared with the baseline survey conducted in 2014, the results shows that the GAM Rate from this survey is relatively lower than the baseline survey although not statistically significant which recorded a GAM rate of 5.7% (4.2 – 7.6, 95% CI) %. The GAM Rate in the slums of Nairobi was 4.6% which translates to approximately 23,791cases with the estimated cases of SAM being 517. Thus, there is need for concerted efforts by all stakeholders to address the major drivers of malnutrition in the slums.

According to Nutrition Causal Analysis conducted in Viwandani and Mukuru Slums in January 2017 showed Poor health care, inadequate care practices and Household low food intake as the drivers of malnutrition in Nairobi Slums.

[10] WHO cut off points for wasting using z-score (-2 Z scores in populations: <5% - Acceptable; 5-9% - Poor; 10-14% - Serious; >15% - Critical)

[11] Emergency Level: SAM > 4%

NUTRITION STATUS BY SUB COUNTY

Further analysis of the nutrition data by Sub County showed that Kamukunji (Kiambio/ Majengo) and Dagoretti (Kawangware/Gatina) Sub County had the highest prevalence of malnutrition (wasting) at 9.6% and 9.2% respectively. In terms of stunting, Ruaraka (Korogocho) Sub County had the highest prevalence at 31.8% while Kamukunji (Kiambio / Majengo) Sub County had the highest prevalence of underweight cases. This is as shown by the table below:

TABLE 7: NUTRITION STATUS BY SUB COUNTY

	Wasting	Severe Wasting	Stunting	Underweight	MUAC
Makadara(Viwandani)	2.20%	0.00%	26.10%	6.50%	2.20%
Embakasi East(Mukuru)	5.70%	0.60%	26.60%	8.50%	1.70%
Lan'gata (Kibera)	1.70%	0.00%	21.20%	10.30%	1.70%
Dagoretti(Kawangware/Gatina)	9.20%	1.10%	20.90%	13.80%	4.50%
Ruaraka(Korogocho)	6.70%	0.00%	31.80%	18.80%	3.60%
Kasarani(Gitare)	6.00%	0.00%	27.50%	8.20%	3.70%
Starehe(Mathare)	2.50%	0.00%	26.90%	5.00%	2.50%
Embakasi West(Kayole Soweto)	1.20%	0.00%	27.70%	5.90%	0.00%
Kamukunji(Kiambio/ Majengo)	9.60%	1.90%	20.00%	21.20%	5.70%

PREVALENCE OF ACUTE MALNUTRITION BY MUAC

The nutrition situation was also assessed using the MUAC and in comparison with the GAM rates by the WFH scores.

TABLE 8: PREVALENCE OF ACUTE MALNUTRITION BASED ON MUAC (AND/OR OEDEMA)

	All n = 860	Boys n = 417	Girls n = 443
Prevalence of global malnutrition (< 125 mm and/or oedema)	(22) 2.6 % (1.5 - 4.3 95% C.I.)	(9) 2.2 % (1.0 - 4.6 95% C.I.)	(13) 2.9 % (1.5 - 5.5 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(19) 2.2 % (1.3 - 3.8 95% C.I.)	(8) 1.9 % (0.8 - 4.3 95% C.I.)	(11) 2.5 %(1.3 - 4.6 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(3) 0.3 % (0.1 - 1.1 95% C.I.)	(1) 0.2 % (0.0 - 1.8 95% C.I.)	(2) 0.5 % (0.1 - 1.8 95% C.I.)

Using MUAC and/or Oedema, the prevalence of GAM in the slums was found to be 2.6% (1.5- 4.3 95% CI) while the prevalence of SAM was 0.3% (0.1- 1.1 95% CI). In comparison with the previous SMART survey results in 2014, the GAM by MUAC was 3.3% (2.3-4.9) there was no significant change that was detected.

PREVALENCE OF UNDERWEIGHT

The measure of underweight gives a mixed reflection of both the current and past nutrition experience by a population and is very useful in growth monitoring. Percentage of children underweight describes how many children under five years have a weight for-age below minus two standard deviations of the NCHS/ WHO reference median and Children who are WFA Z score fell below -3 standard deviation of the WHO reference population were classified as severe underweight.

TABLE 9: PREVALENCE OF UNDERWEIGHT BASED ON WEIGHT-FOR-AGE

	All n = 841	**Boys** n = 407	**Girls** n = 434
Prevalence of underweight **(<-2 z-score)**	(96) 11.4 % (8.8 - 14.7 95% C.I.)	(49) 12.0 % (8.6 - 16.6 95% C.I.)	(47) 10.8 % (7.6 - 15.1 95% C.I.)
Prevalence of moderate underweight **(<-2 z-score and >=-3 z-score)**	(82) 9.8 % (7.3 - 12.9 95% C.I.)	(39) 9.6 % (6.6 - 13.8 95% C.I.)	(43) 9.9 % (6.9 - 14.1 95% C.I.)
Prevalence of severe underweight **(<-3 z-score)**	(14) 1.7 % (1.0 - 2.7 95% C.I.)	(10) 2.5 % (1.4 - 4.3 95% C.I.)	(4) 0.9 % (0.3 - 2.4 95% C.I.)

The results in the above table show that the prevalence of underweight using the weight-for-age z-score in slums of Nairobi was found to be 11.4% (8.8-14.7 95% CI). This prevalence of underweight was classified as medium using the WHO classification of underweight[12]. On the other hand the overall prevalence of severe underweight was found to be 1.7% (1.0- 2.7 95% CI) which is considered normal.

When compared with the baseline survey conducted in 2014, the results shows that the underweight from this survey is relatively lower than the baseline survey which recorded underweight of 12.9% (10.5-15.9 95% CI) with the difference being insignificant.

PREVALENCE OF STUNTING

The prevalence of stunting is the conventional anthropometric measure that reflects long-term chronic undernutrition, failure of linear growth and multifactorial social deprivation, a long-term response to the prolonged deprivation of food and/or presence of disease and other factors which interrupt normal growth. Unlike wasting, stunting is not affected by seasonality but rather related to the long-term effect of socio-economic development and long-standing food insecurity situation.

[12] WHO Classification of Underweight: Low - <10%, Medium – 10 – 19.9%, High – 20 – 29.9%, Alarming/Critical - >30%

TABLE 10: PREVALENCE OF STUNTING BASED ON HEIGHT-FOR-AGE

	All n = 821	Boys n = 399	Girls n = 422
Prevalence of stunting **(<-2 z-score)**	(214) 26.1 % (22.9 - 29.5 95% C.I.)	(113) 28.3 % (23.7 - 33.5 95% C.I.)	(101) 23.9 % (20.6 - 27.6 95% C.I.)
Prevalence of moderate stunting **(<-2 z-score and >=-3 z-score)**	(151) 18.4 % (15.7 - 21.5 95% C.I.)	(78) 19.5 % (15.6 - 24.2 95% C.I.)	(73) 17.3 % (14.4 - 20.7 95% C.I.)
Prevalence of severe stunting **(<-3 z-score)**	(63) 7.7 % (6.0 - 9.8 95% C.I.)	(35) 8.8 % (6.2 - 12.2 95% C.I.)	(28) 6.6 % (4.5 - 9.6 95% C.I.)

The results of the survey show that the prevalence of stunting in the Slums of Nairobi was 26.1% (22.9-29.5 95% CI) which is categorized as high based on the WHO classification[13]. Further, the prevalence of severe stunting was found to be 7.7% (6.0-9.8 95% CI) which is considered high. The high stunting levels in the slums represent poor nutrition in the first 1,000 days of a child's life. In these crucial days, the building blocks are established for the development of the brain and for future growth. Any alteration in this stage has long-term implications, and the damage caused by undernutrition in the early years of life is largely irreversible and associated with impaired cognitive ability and reduced school and work performance.

When compared with the baseline survey conducted in 2014, the results shows that the stunting from this survey is relatively lower than the baseline survey which recorded a stunting of 33.5% (30.1-37.2 95% CI) with the difference being significant. The significant decline in the stunting rates can be attributed to the Process for Promoting Child Feeding (ProPAN) which was implemented within the slums of Nairobi with support from Concern.

MATERNAL NUTRITION STATUS

Maternal malnutrition is usually associated with high risk of low birth weights and it is recommended that before, during and after birth, the maternal nutrition status should be adequate. The maternal malnutrition was defined as women whose MUAC measurements were < 21.0cm while women whose MUAC measurements were between 21.0 <23.0cm were classified as at risk of malnutrition. The proportion of malnourished Women of reproductive Age is 0.3% (n=3) while 3.9% (n=36) were proportion of women of reproductive age at risk. For the pregnant and lactating women malnourished, only 0.2% (n=1) as shown in the table below:

[13] WHO Classification: Low - <20%, Medium - 20 – 29.9% , High – 30 – 39.9%, Alarming/Critical - >40.0%

TABLE 11: MATERNAL NUTRITION STATUS USING MUAC

Indicator	n	N	%
MUAC <21.0 cm for all women	3	925	0.3%
MUAC (210 - <230 mm) for all women	36	925	3.9%
MUAC <21.0 cm for PLW	1	456	0.2%

ACCESS AND UTILIZATION OF HEALTH AND NUTRITION SERVICES

VITAMIN A SUPPLEMENTATION

Vitamin A deficiency is a major contributor to the mortality of children under five.[14] Improving the vitamin A status of deficient children through supplementation enhances their resistance to disease and can reduce mortality from all causes by approximately 23 per cent.[15] Guaranteeing high supplementation coverage is therefore critical, not only to eliminating vitamin A deficiency as a public-health problem, but also as a central element of the child survival agenda. Vitamin A is also an essential micronutrient for the immune system and plays an important role in maintaining the epithelial tissue in the body. Severe Vitamin A Deficiency (VAD) can cause eye damage. VAD can also increase severity of infections such as measles and diarrheal diseases in children and slow recovery from illness.
The results of the survey showed that the overall proportion of children (12-59 Months) supplemented with Vitamin A for at least 2 times in the period of one year preceding the survey was 49.9% which is way below the national target of 80%. However, for children aged 6-11 months, 87.2% had received Vitamin A once while for children aged 12-59 months, 80.2% had received Vitamin A once. Overall, for children aged 6-59 months, 80.9% had received vitamin A once.

Periodic deworming for organisms like helminthes and schistosomiasis (bilharzia) can improve children's micronutrient status. On deworming coverage, the results showed an overall coverage of 65.1%.

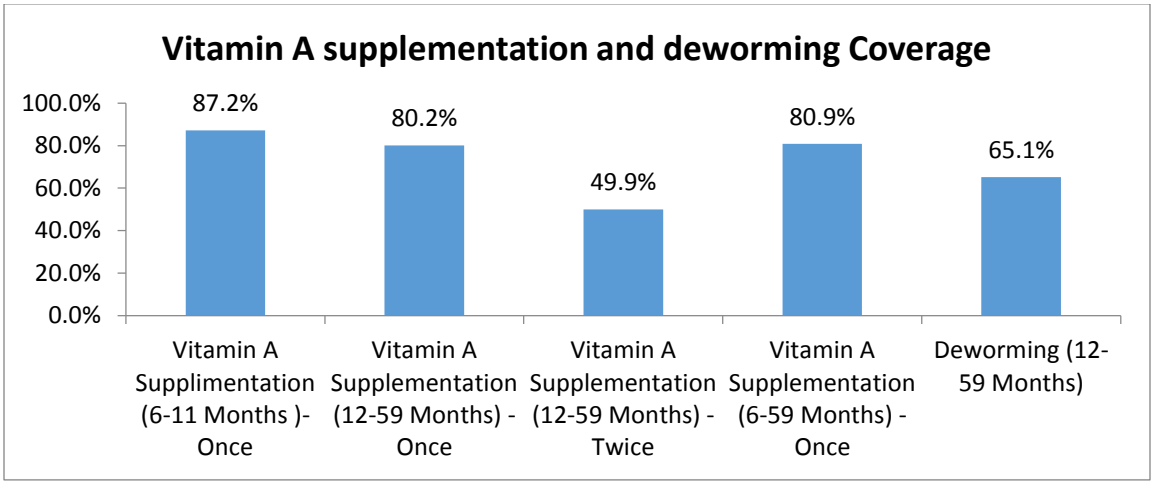


FIGURE 4: VITAMIN A SUPPLEMENTATION (6-59 MONTHS) AND DEWORMING COVERAGE (12-59 MONTHS)

MICRO NUTRIENT POWDERS (INFANTS AND YOUNG CHILDREN AGED 6–23 MONTHS)

Infants and children are the groups that are most vulnerable to micronutrient deficiency, given the high vitamin and mineral intake they need to support their rapid growth and adequate development. Interventions to prevent and/or treat micronutrient deficiencies exist, including promotion of breastfeeding, fortification of staple and complementary foods, and provision of supplements. However,

[14] World Health Organization, The World Health Report 2002: Reducing risks, promoting healthy life, WHO, Geneva, 2002, p. 55.

[15] Beaton, George H., et al., 'Effectiveness of Vitamin A Supplementation in the Control of Young Child Morbidity and Mortality in Developing Countries', ACC/SCN State-of-the-Art Series, Nutrition Policy Paper No. 13, Geneva, 1993.

implementation bottlenecks and barriers (including lack of adherence to dosing regimens, low acceptability, poor distribution channels, and lack of availability of skilled health workers) may reduce the effectiveness and impact of these and other interventions to address micronutrient deficiencies. Multiple micronutrient powders have been developed as alternative way of providing micronutrients to populations where other interventions are difficult to implement.
Multiple micronutrient powders are single-dose packets of vitamins and minerals in powder form that can be sprinkled onto any ready to eat semi-solid food consumed at home, school or any other point of use. The powders are used to increase the micronutrient content of a child's diet without changing their usual dietary habits.
With regard to the survey, only 2.3% (9) of the respondent who were enrolled in the MNP program and 77.8% (7) who had consumed in the last 7 days.. 83.2% of the respondent who were not enrolled in the MNP program said that they do not know MNPs and 11.4% said that the child has not fallen sick hence not gone the facility.

CHILD IMMUNIZATIONS

According to the guidelines developed by the World Health Organization, children are considered to have received all basic vaccinations when they have received a vaccination against tuberculosis (also known as BCG), three doses each of the DPT-Hep B-Hib (also called pentavalent) and polio vaccines, and a vaccination against measles. The BCG vaccine is usually given at birth or at first clinical contact, while the DPT-Hep B-Hib and polio vaccines are given at approximately age 6, 10, and 14 weeks. Measles vaccinations should be given at or soon after age 9 months.
Information on vaccination coverage was obtained in two ways: from written vaccination records, including the Mother and Child Health Booklet and other health cards, and from mothers' verbal reports. All mothers were asked to show the interviewer health cards used for the child's immunization.
From the survey results, 97.3% (n=799) of children were reported to have received BCG and confirmed by Scar. In terms of Measles vaccination at 9 months, 97% of the children had received the vaccination where 60.3% confirmed by card while 36.75% confirmed by recall. At 18 months, 83.8% had received measles vaccination where 47.9% were confirmed by card while 35.9% was by mothers recall. In terms of OPV 1, 99.3% had received the immunization where 63% was confirmed by card while 35.7% was by recall. For OPV 3, 96.5% had received the immunization where 60.8% was confirmed by card while 35.7% was confirmed by recall. This is as shown in the graph below:

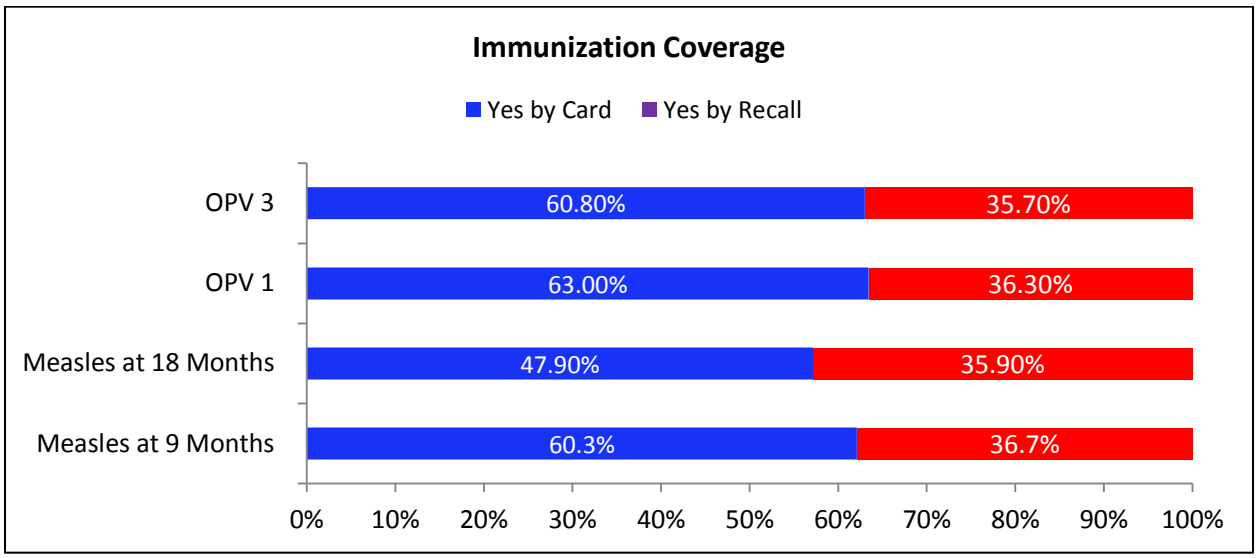


FIGURE 5: MEASLES AND OPV1 AND OPV3 COVERAGE

MORBIDITY

Undernutrition and childhood morbidity have a synergistic relationship. The interrelationship of the two is in such a way that illness can suppress appetite precipitating undernutrition of a child while, on the other hand, nutritional deficiencies increase the susceptibility of the child to infectious diseases.

The survey found out that, 46.1% (391) of children aged 6-59 months in Nairobi County were reported to have been ill two weeks prior to survey. The most prevalent illness during this period was acute respiratory illnesses/ cough at 44.5%, fever with chills (35.5%) and watery diarrhea (24.6%) as shown in the graph below:

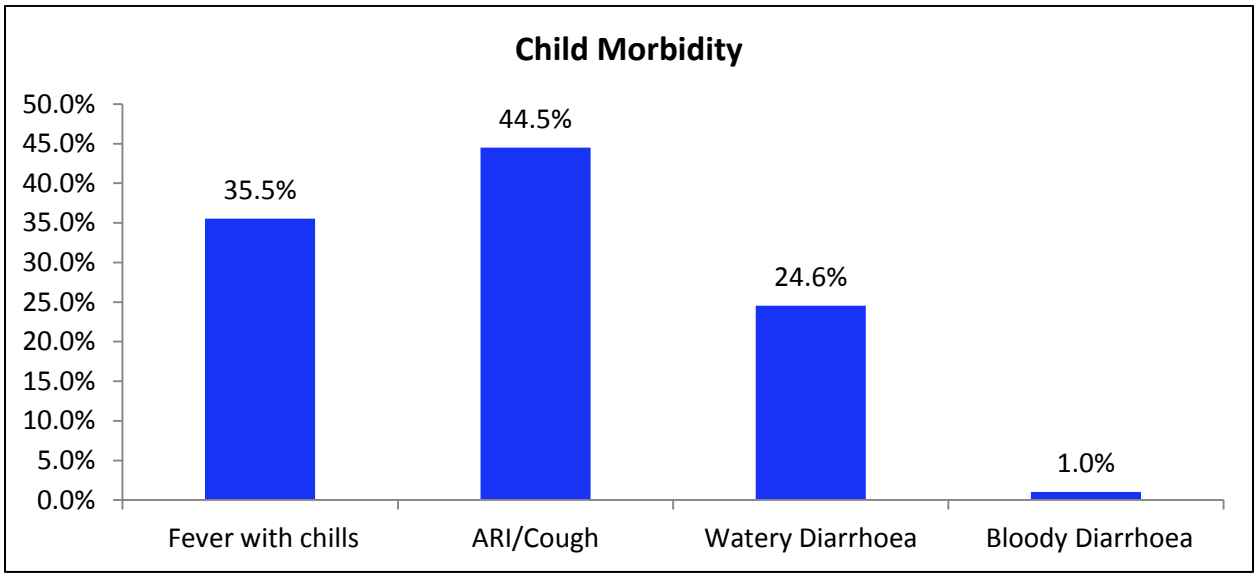


FIGURE 6: CHILD MORBIDITY

Further analysis on the children who had diarrhea, the survey results showed that the prevalence of watery diarrhea was 24.6% (n=96) and for bloody diarrhea at 1.0% (n=4). For the children with watery Diarrhoea, 76.0% were supplemented using zinc or oral rehydration salts (ORS), which is below the HiNi target of 80%.

This is as highlighted in the table below:

TABLE 12: DIARRHOEA CASES

	Nairobi		
	n	N	%
Prevalence of Watery Diarrhea	96	391	24.6%
Prevalence of Bloody Diarrhea	4	391	1.0%
Zinc Supplementation/ORS	73	96	76.0%

HEALTH SEEKING BEHAVIOR

Prompt and appropriate health seeking is critical in the management of childhood illnesses. A variety of factors have been identified as the leading causes of poor utilization of primary health care services.

These include poor socio-economic status, lack of accessibility, cultural beliefs and perceptions, low literacy level of the mothers and large family size.[16]

The health seeking behavior was 80.1% (313) of children in Nairobi County with, majority seeking from private clinics and public clinics (40.6%). Others included from NGOs (3.5%) and from community health volunteers (2.6%). This is as shown in the graph below.

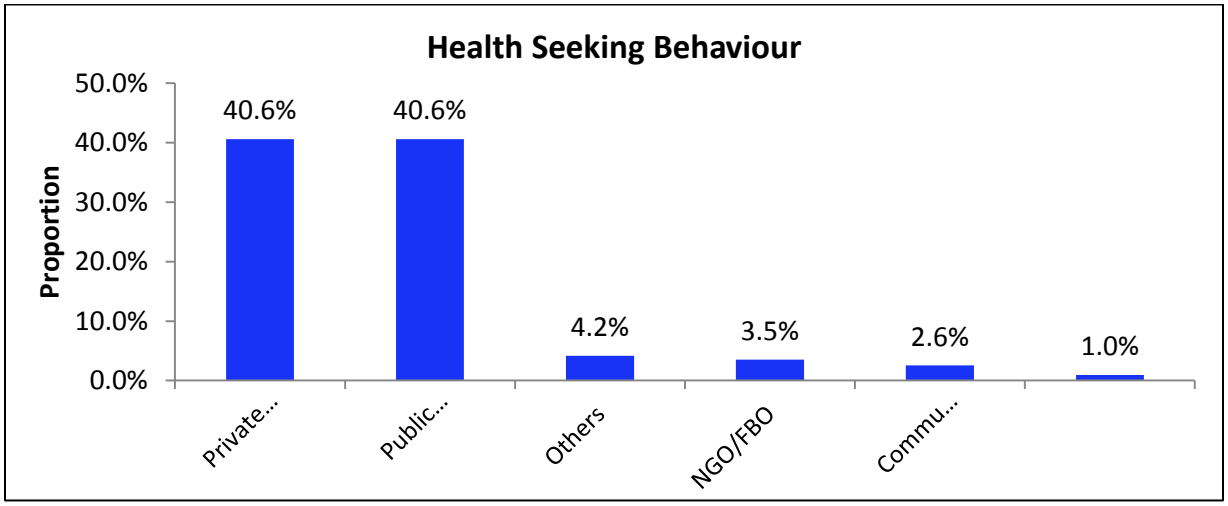


FIGURE 7: HEALTH SEEKING BEHAVIOUR

[16] Health seeking behavior and health service utilization in Pakistan: challenging the policy makers. Shaikh BT, Hatcher J J Public Health (Oxf). 2005 Mar; 27(1):49-54.

WATER AND SANITATION

MAIN SOURCE OF WATER

Increasing access to improved drinking water is one of the Millennium Development Goals (MDG) that Kenya along with other nations worldwide has adopted (United Nations General Assembly 2001). Improved water sources include piped water into the dwelling, yard, or plot; a public tap/standpipe or borehole; a protected well or protected spring water; rainwater; and bottled water. Lack of easy access to an improved water source may limit the quantity of suitable drinking water that is available to a household as well as increase the risk of illness. Unimproved water sources increase the spread of waterborne disease and the burden of service delivery through increased demand for health care; these sources include unprotected wells or springs, water delivered by tanker trucks, and surface water.

According to the survey, 40.6% of the households in Nairobi County have public taps/ standpipe as the main source of water, while 24.9% have pipe water to yard/ plot, 13.9% piped to neighbor, 10.6% piped into dwelling while 4.6% got water from the water kiosk. This is as shown in the graph below:

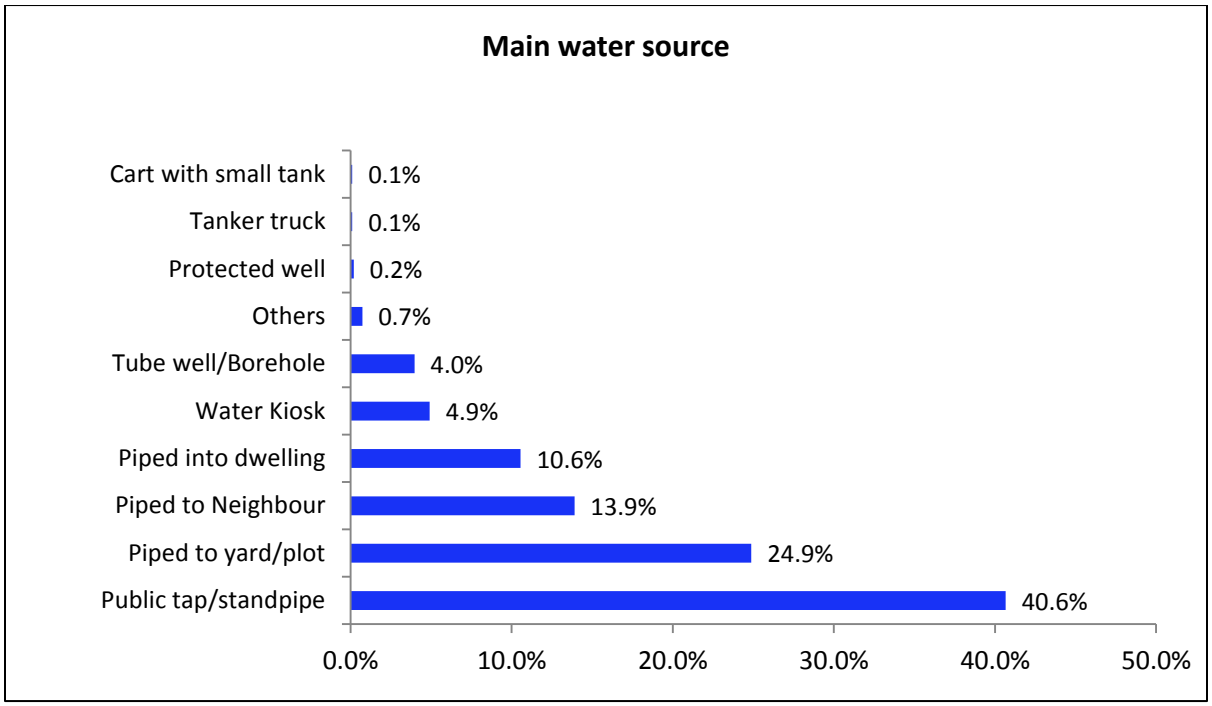


FIGURE 8: MAIN SOURCE OF WATER

Everyone has the right to water. This right is recognized in international legal instruments and provides for sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is necessary to prevent death from dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking, and personal and domestic hygienic requirements.

In terms of water quantity consumption in Nairobi County, 96.8% (n=926) of the households consumed more than 15 liters per day. While only 3.2% (n=31) consumed less than 15 liters. The mean water consumption per household was 67.1 liters.
This is as highlighted in the table below:

TABLE 13: WATER CONSUMPTION

Water Quantity Consumption	Nairobi	Mean water consumption per HH
HH consuming <15litres per day	3.2%(31)	67.1 Liters
HH consuming >15litres per day	96.8%(926)	

ACCESS OF WATER AND SANITATION FACILITY

Rapid urbanization has left Kenyan cities unable to cope with the huge demand for basic services such as water and sanitation. Some 15 million city dwellers lack access to a piped water supply or sanitation services, and this number continues to rise. The impact this has on health is severe – across Kenya, around 20,000 people die each year from diarrhoea, most of which is directly attributed to poor water, sanitation and hygiene[17]

The survey results showed that 92.4% (884) of the households in Nairobi County had a trekking distance of less than 500m or less than 15 minutes to get water while 3.0% trekked for 500m to 2km or 15 minutes to 1 hour to get water. In terms of queuing at water points, the majority 56.4%(377) indicated that the queued for less than 30 minutes while 28.7% queued for between 30 minutes to 1 hour. It worth noting 14.8% (99) of the Nairobi County residence queued for more than 1 hour at the water point. This is as shown in the Table below.

TABLE 14: TREKKING DISTANCE AND QUEUING FOR WATER

Indicator	Category	n	%
Trekking distance to the Water Point	Less than 500m (<15min)	884	92.4%
	>500m to <2km(15 to 1 hour)	29	3.0%
	More than 2 km	3	0.3%
Queueing time at the water point	Less than 30 minutes	377	56.4%
	30-1 hour	192	28.7%
	More than 1 hour	99	14.8%

Hygienic sanitation facilities are crucial for public health,99.9% of the households reported that they have access to toilets where 28.4% reported to have access to pit latrine with slab, 26.5% had flush to piped sewer system, 13.8% had pit latrine without slab while 6.7% had flush to septic tank

Although 99.9% reported to have access to toilets, NCA conducted in January showed the disposal of the waste was mostly draining into a river that is highly polluted. Jitegemee -bucket toilet provided by Oxfam did not solve the problem and homes using the buckets were stigmatized. Community members would empty the buckets in the river and open trenches at 5am hence this leading to fecal-oral contamination and waterborne diseases such as, cholera.

This is as summarized in the graphs below:

[17] http://www.wsup.com/programme/where-we-work/kenya/

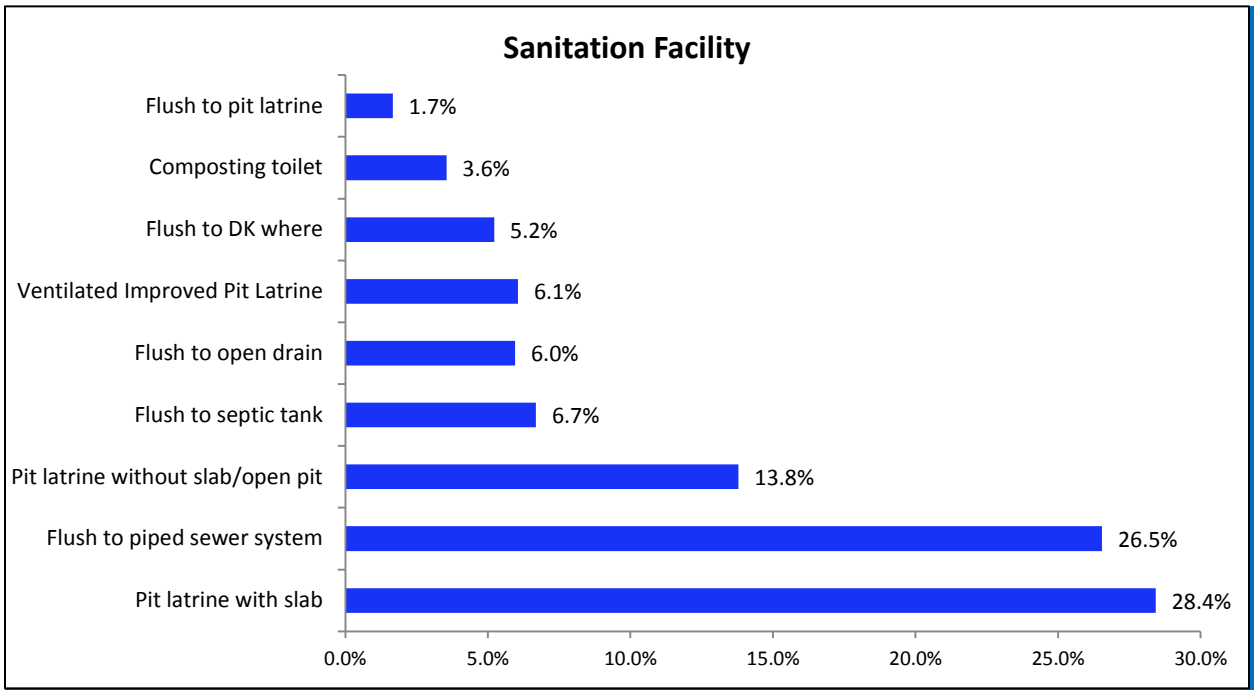


FIGURE 9: SANITATION FACILITY

WATER TREATMENT AND HAND WASHING

Handwashing with soap is one of the most effective and inexpensive interventions for preventing diarrheal diseases and pneumonia, which together account for 3.5 million child deaths annually worldwide.18 Handwashing is important for good health. Effective washing can be practiced with alternatives to soap and using a variety of different hygienic facilities. Overall, interventions to promote handwashing might save a million lives a year. Each person should be able to wash hands with water and soap after toilet use, before food preparation, before eating and after cleaning babies.

The results of the survey showed that 51.8% (n=496) of the households reported treating water before drinking. Majority of the respondent 61.3% (304) boiled the water, 45.0% (223) used chemicals while only 0.8% (4) used pot filters.
With regard to handwashing at 4 critical times, the results of the survey showed that among the caregivers interviewed 18.7 (n=161) reported practicing proper hand washing at the 4 critical times. This was also evidenced during the Nutrition Causal Analysis carried out in January 2017 in Viwandani and Mukuru Slums that "*Homes and schools do not have hand washing facilities. Hand washing practices by both the caregivers and the children was also poor* "This is as summarized in the table below:

TABLE 15: HANDWASHING AT CRITICAL TIMES

Indicator	n	%
Water Treatment		
Water Treatment	496	51.8%
Boiling	304	61.3%
Chemicals	223	45.0%

[18] Cairncross, S. and Valdmanis V. (2006) Chapter 41: Water Supply, Sanitation, and Hygiene Promotion. In D.T. Jamison, J.G. Breman, A.R. Measham, et al. (Editors), Disease Control Priorities in Developing Countries, 2nd edition (771-792). Washington (DC): World Bank.

Pot filters	4	0.8%
Hygiene		
Household Which wash Hands	860	89.9%
After Toilet	805	93.6%
Before cooking	416	49.5%
Before Eating	714	83.0%
After taking children to the toilet	286	33.3%
Hand washing by Soap and water	741	86.2%
hand washing 4 critical times	161	18.7%

PAYMENT AND WATER STORAGE

Study shows households where their water storage vessel had a cover had a reduced prevalence of any STH infection compared to households where the vessel was not properly covered.[19] With regard of water storage over 80% of the resident in Nairobi County store water in closed container/Jerri can. With regard to payment of water, 81.1% (776) of Nairobi County pay for water with 89.8% (697) paying per 20Litre Jerri can while 10.2% (79) paying on monthly basis.

TABLE 16: WATER STORAGE AND PAYMENT FOR WATER

Indicator	Category	n	%
Water Storage	Open Container/Jerri can	111	11.6%
	Closed Container/Jerri can	846	88.4%
Pay for Water	Pay for Water	776	81.1%
Mode of Payment	Per 20L Jerri can	697	89.8%
	Per month	79	10.2%

OWNERSHIP OF MOSQUITO NET

Mosquito net are known to be highly effective in reducing malaria morbidity and mortality. However, usage varies among households, and such variations in actual usage may seriously limit the potential impact of nets. The survey sought to know on ownership and results showed that in terms of mosquito net ownership, 66.2% of the households in Nairobi County owned them while 33.8% did not have ownership of mosquito nets. This is as shown in the graph below:

[19] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4780697/

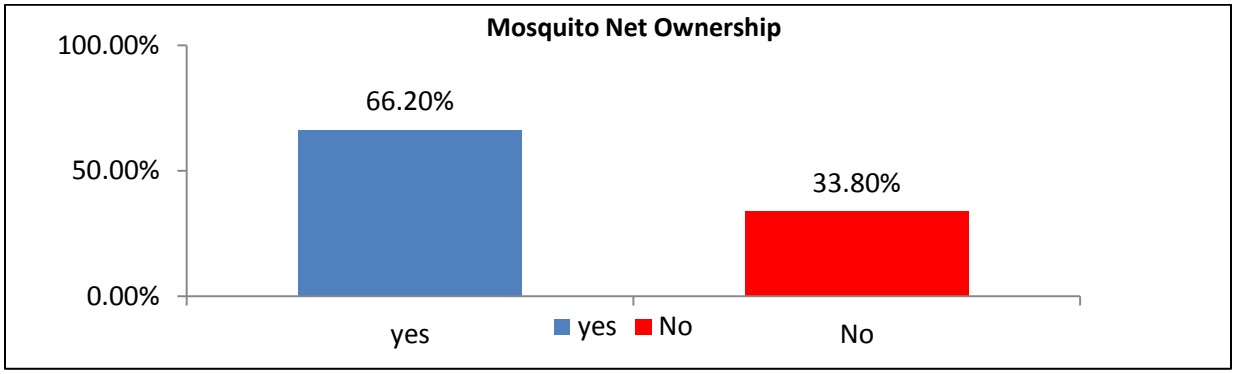


FIGURE 10: MOSQUITO NET OWNERSHIP

MATERNAL NUTRITION

IRON SUPPLEMENTATION

Iron deficiency is caused by inadequate iron intake to meet normal requirements or increased requirements due to excessive blood loss and reproduction. All pregnant women need iron because a woman will become iron deficient with or without anemia by the end of her pregnancy, if she does not take iron supplements (Lynch, 2000).

From the survey results, 85.8% (n=416) of caretakers with children aged 24 months and below were supplemented with Iron Folic acid in their last pregnancy. The mean number of days IFAS was consumed by the women was 56.9 days. In addition, 68.3% (n=284) of the women interviewed consumed the IFAS less than 90 days while 30.8% consumed between 90 and 180 days while only 1.0% consumed for more than 180 days.

This is as summarized in the graph below:

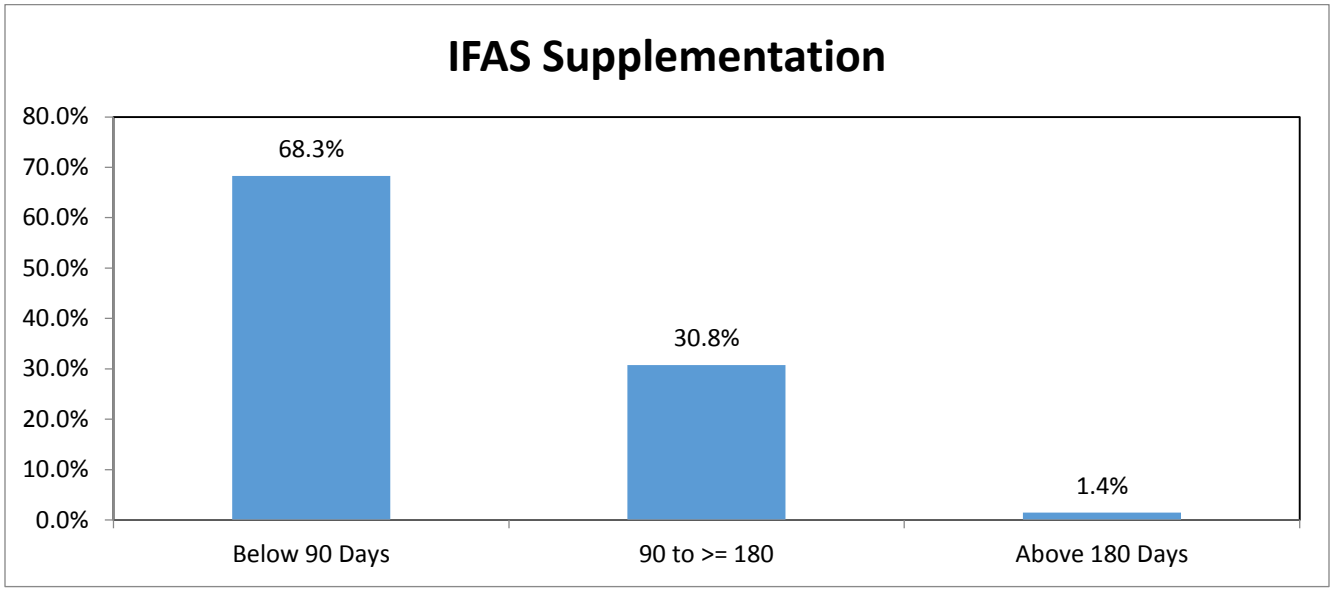


FIGURE 11: IFAS SUPPLEMENTATION

FOOD SECURITY

WOMEN DIETARY DIVERSITY (24-HOUR RECALL)

Women of reproductive age (WRA)[20] are often nutritionally vulnerable because of the physiological demands of pregnancy and lactation. Requirements for most nutrients are higher for pregnant and lactating women than for adult men[21]. Outside of pregnancy and lactation, other than for iron, requirements for WRA may be similar to or lower than those of adult men, but because women may be smaller and eat less (fewer calories), they require a more nutrient-dense diet [22].

Insufficient nutrient intakes before and during pregnancy and lactation can affect both women and their infants. Yet in many resource poor environments, diet quality for WRA is very poor, and there are gaps between intakes and requirements for a range of micronutrients[23].

In assessing the nutritional quality and quantity of the food consumed by the surveyed women of reproductive age, a 24 hour recall period household dietary diversity questionnaire was administered and consumption of 10 food groups in Nairobi County is depicted in the graph below.

In terms of maternal nutrition practices, the survey results showed that majority of the women aged 15-49 years consumed starchy foods (95.4%), other vegetables (93.5%), vitamin A vegetables (85.2%), dairy products (68.4%) and other fruits (51.3%). Flesh foods, eggs and nuts were the least consumed with 38.4%, 29.4% and 13.8% respectively of the caregivers interviewed reporting to have consumed in the past 24 hours.

This is as summarized in the graph below:

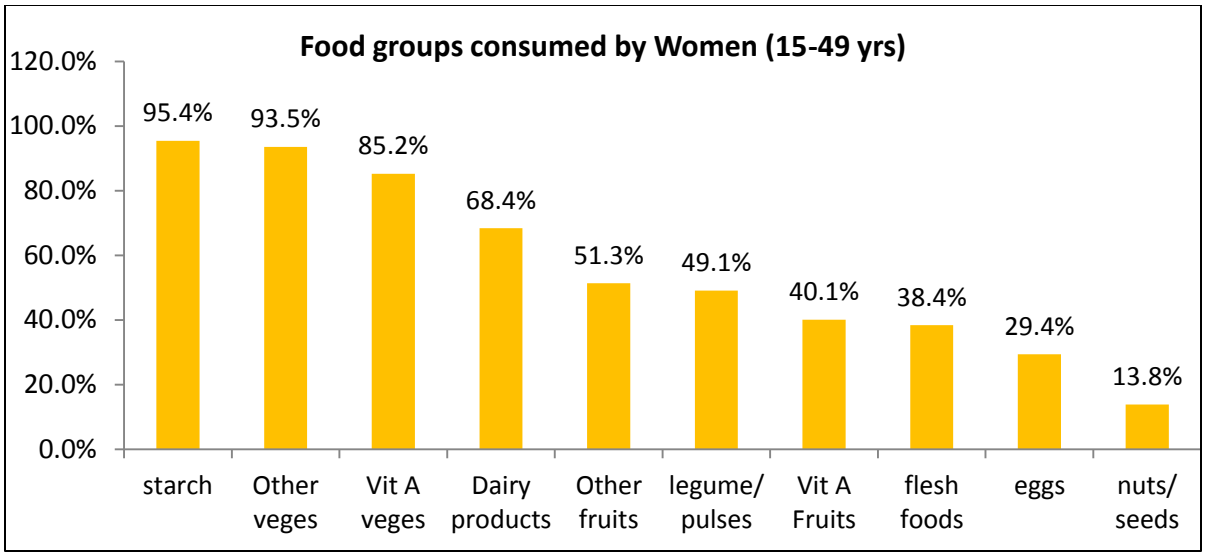


FIGURE 12: WOMEN DIETARY DIVERSITY

[20] For the purposes of this document and indicator, WRA are defined as those 15–49 years of age.

[21] National Research Council, 2006; World Health Organization [WHO]/Food and Agriculture Organization of the United Nations [FAO], 2004

[22] Nutrient density" refers to the ratio of nutrients (such as vitamins and minerals) to the energy content of foods.

[23] Arimond et al., 2010; Lee et al. 2013

MINIMUM DIETARY DIVERSITY FOR WOMEN

MDD-W[24] is a dichotomous indicator of whether or not women 15-49 years of age have consumed at least five out of ten defined food groups the previous day or night. The proportion of women 15–49 years of age who reach this minimum in a population can be used as a proxy indicator for higher micronutrient adequacy, one important dimension of diet quality.

The indicator constitutes an important step towards filling the need for indicators for use in national and subnational assessments. It is a population-level indicator based on a recall period of a single day and night, so although data are collected from individual women, the indicator cannot be used to describe diet quality for an individual woman. This is because of normal day-to-day variability in individual intakes. With regard to Minimum WDDS, 68.6% of the women surveyed had consumed 5 or more food groups. This is as shown in the graph below:

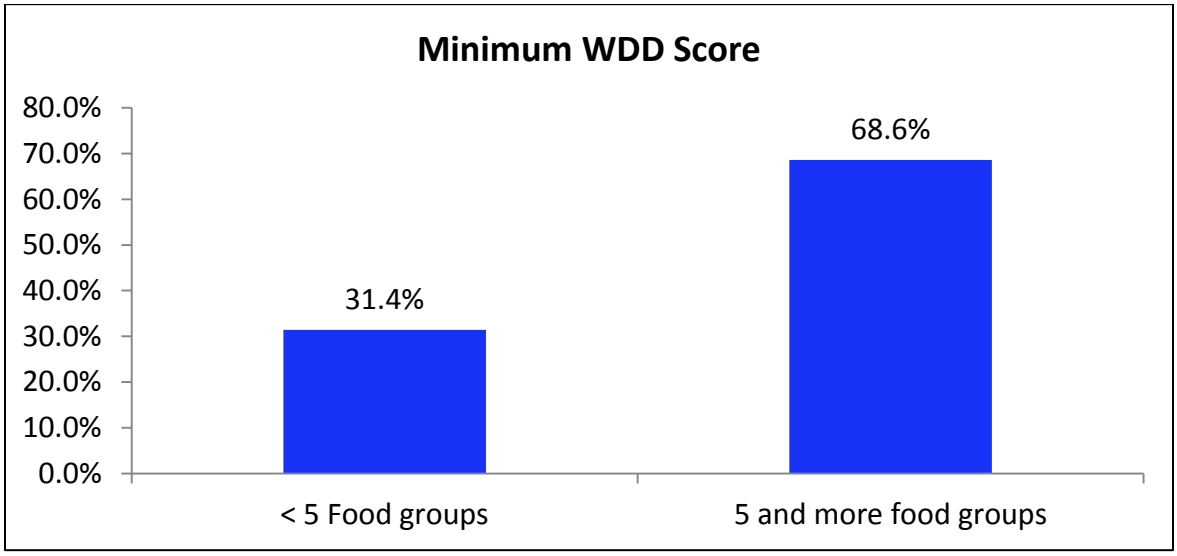


FIGURE 13: MINIMUM WDD SCORE

[24] Additional background on the indicator is available at: http://www.fantaproject.org/monitoring-and-evaluation/ minimum-dietary-diversity-women-indicator-mddw.

HOUSEHOLD DIETARY DIVERSITY (7 DAYS RECALL)

In assessing the nutritional quality and quantity of the food consumed by the survey population, a one week retrospective household dietary diversity questionnaire was administered that would also help to determine the households' economic capacity to consume various foods in the County.
Five main food groups were consumed .This were Vegetables, cereals, Vegetables, Fruits, fats and oils and sweets which were consumed by at least >80% of the population that was surveyed within the last 7 days. Fish, tubers and Condiments were consumed by at least <50% of the surveyed population.
This is as shown in the graph below

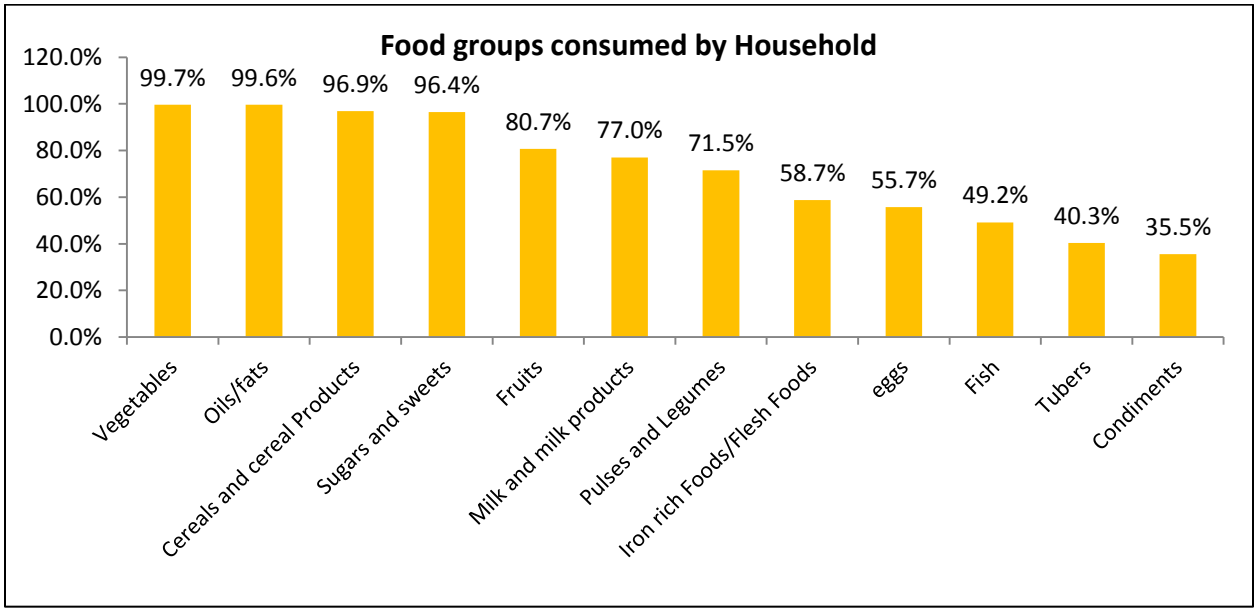


FIGURE 14: HOUSEHOLD DIETARY DIVERSITY

MINIMUM HOUSEHOLD DIVERSITY

Minimum Household Dietary Diversity is indicator of whether or not a household has consumed at least three out of twelve defined food groups within the last 7 days. 0.2% (n=2) of the households surveyed consumed less than 3 food groups, 1.7% (n=16) consumed 3-5 food groups while the majority of the households and 98.1% (n=939) consumed more than 5 food groups. This is as summarized below:

TABLE 17: MINIMUM HDD SCORE

Indicator	Nairobi (%)
Households Consuming <3Food Groups	0.2% (2)
Households Consuming 3-5 Food Groups	1.7% (16)
Households Consuming >5Food Groups	98.1%(939)

MICRONUTRIENT CONSUMPTION FROM HOUSEHOLD DIETARY DIVERSITY

The poor quality of the habitual diet and the lack of dietary diversity in much of the developing world contribute to deficiencies of micronutrients. Micronutrient malnutrition is a global problem much bigger than hunger and imposes enormous costs on societies in terms of ill health, lives lost, reduced economic productivity and poor quality of life.

Addressing the global challenge of micronutrient malnutrition requires the need for many strategies – both short- and intermediate-term and long-term sustainable approaches. In addition to the conventional approaches of micronutrient supplementation and fortification, promoting sustainable food based approaches to enable adequate intakes of micronutrients by much of the population includes dietary diversification strategies and agriculture-based approaches.
With Regard to the survey, 82.2% had consumed staples, 77.8% had consumed Protein, 98.6% had consumed Fruits and vegetables, 28.4% had consumed Vitamin A and 94.5% had consumed Oils and fats for 7 days.

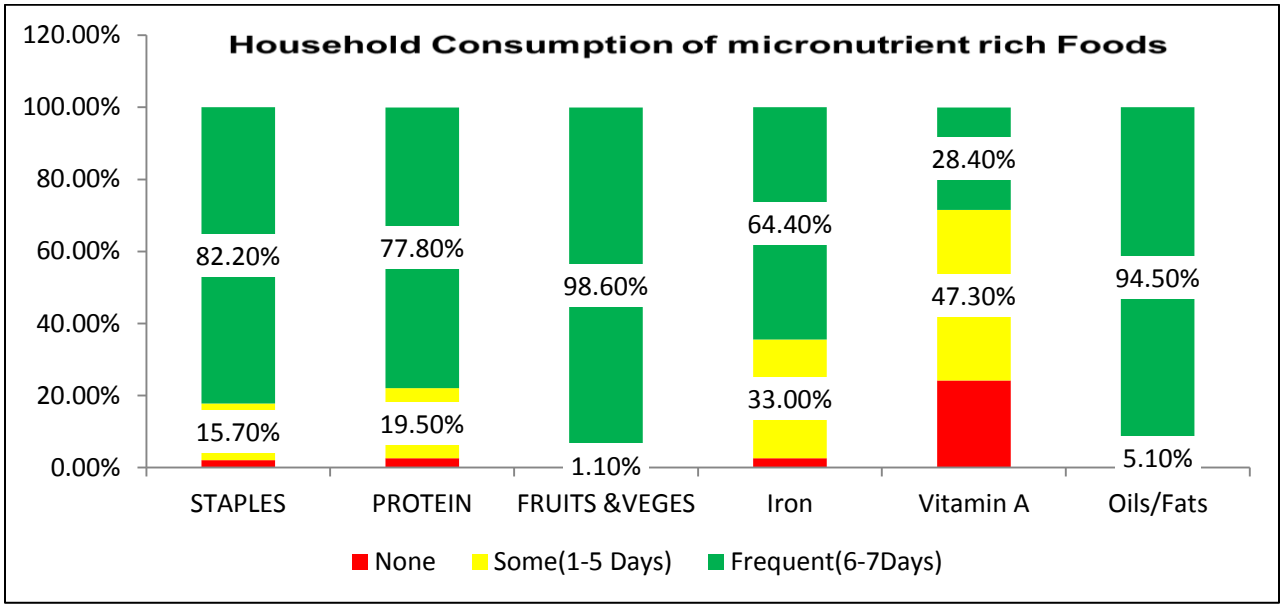


FIGURE 15: HOUSEHOLD CONSUMPTION OF MICRO NUTRIENTS RICH FOODS

In addition, further analysis on the average day's food groups are consumed highlighting the consumption of micronutrients showed that fruits and vegetables were most consumed at an average of 6.9 days followed by oils and fats at 6.8 days, vitamin A were the least consumed at an average of 3.2 days.
This is as highlighted in the graph below:

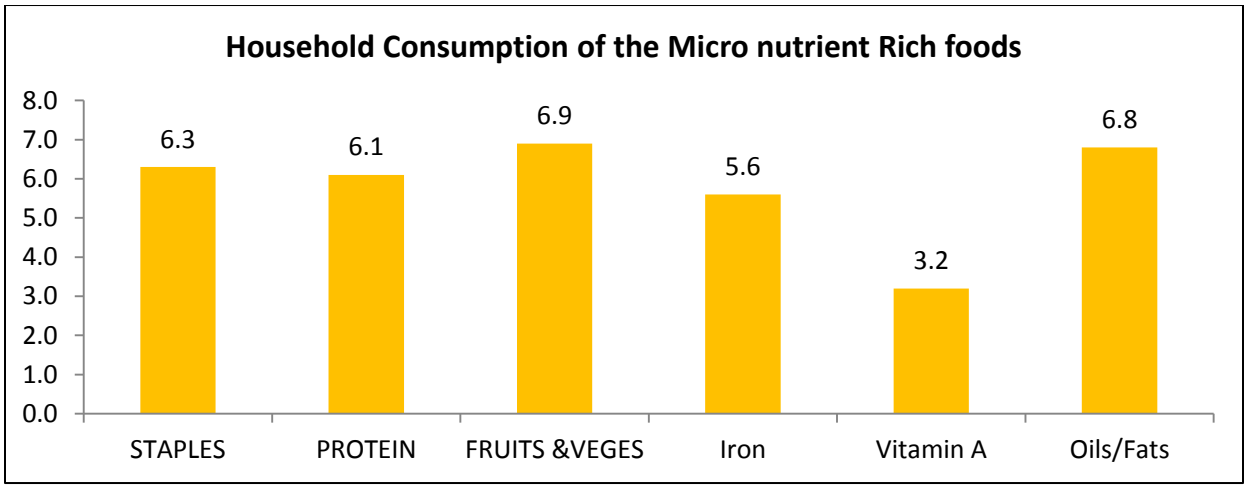


FIGURE 16: AVERAGE NUMBER OF DAYS OF CONSUMPTION OF MICRONUTRIENT RICH FOODS

FOOD CONSUMPTION SCORE

The food consumption score is an acceptable proxy indicator to measure caloric intake and diet quality at household level, giving an indication of food security status of the household. It's a composite score based on dietary diversity, food frequency and relative nutritional importance of different food groups. The survey results showed that majority of the households in Nairobi County (77.0%) had a good food consumption score while 19.2% were at the border food consumption score and only 3.8% had a poor food consumption score. This is as shown in the graph below:

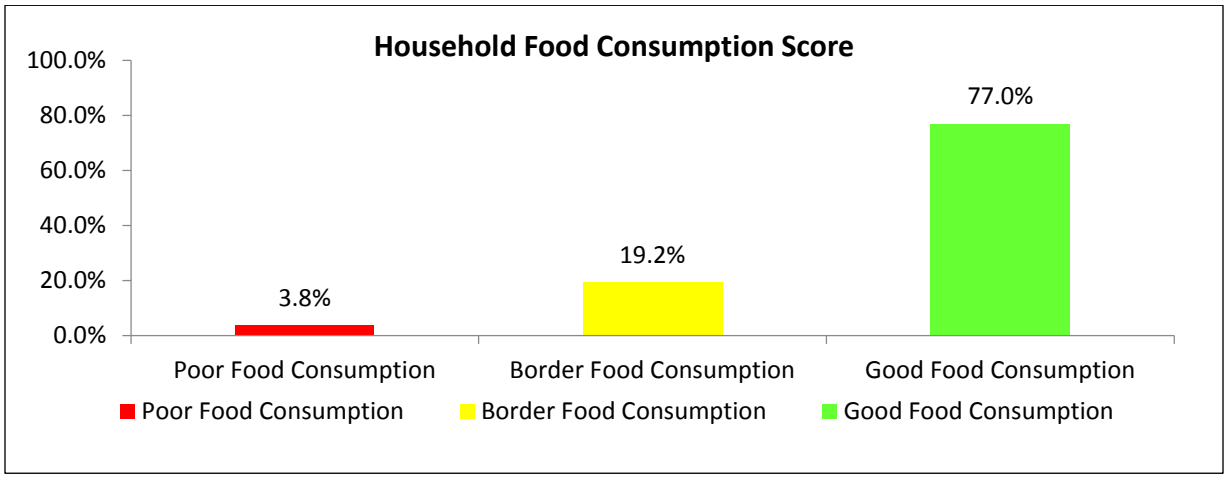


FIGURE 17: HOUSEHOLD FOOD CONSUMPTION

Further analysis of the food consumption score comparing the frequency of consumption of protein, Vitamin A and Iron- rich foods in the past 7 days. The survey results showed that the majority 92.6% consumed vitamin A rich foods while 75.0% of the respondents consumed protein rich foods and only 8.5% of the respondents consumed hem iron-rich foods for 7 days. This is as shown in the graph below:

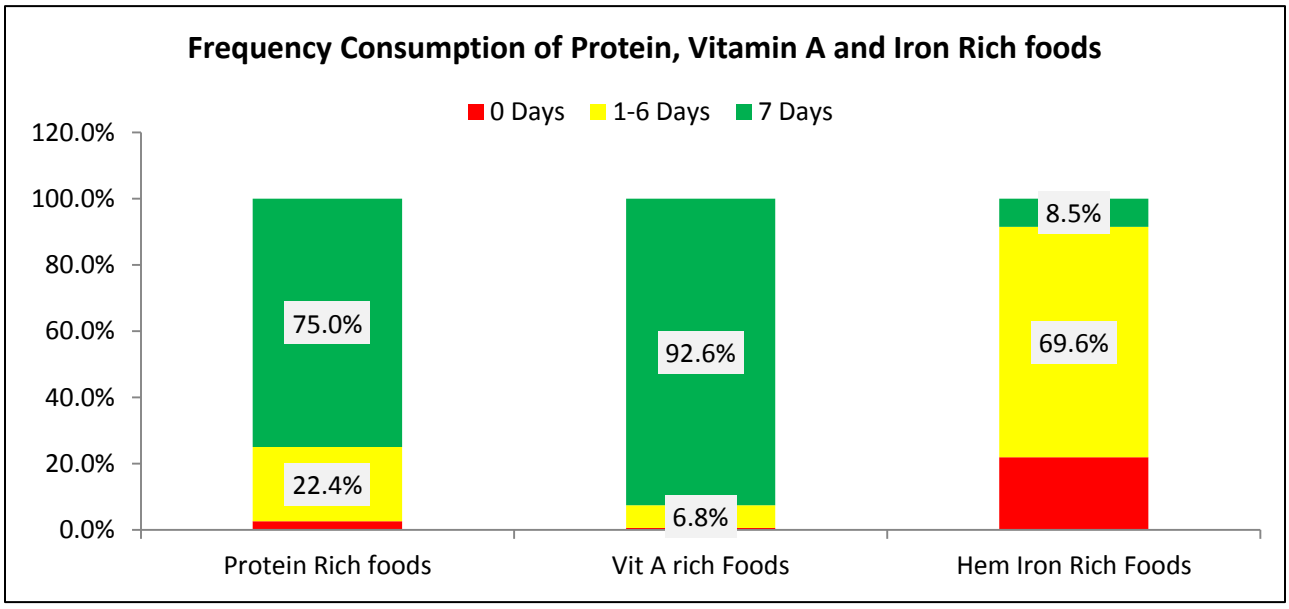


FIGURE 18 : FREQUENCY OF CONSUMPTION OF PROTEIN, VITAMIN A AND IRON HEM RICH FOODS

FOOD CONSUMPTION SCORE _NUTRITION

WFP's key corporate indicator for measuring food insecurity is the Food Consumption Score (FCS) used to define categories of household (HH) food insecurity. The information gathered to develop the FCS additionally provides a wealth of unexploited data that can be used to inform on nutrient rich groups consumed by the HH and which are essential for nutritional health and well-being: protein, iron and vitamin A.
All macronutrients (carbohydrates, proteins and lipids) and micronutrients (vitamins and minerals) are important to ensure a healthy life, and all nutrients should be represented in a sufficient quantity for a balanced diet.
Macronutrients are good sources of energy. A lack in energy quickly leads to acute undernutrition. An insufficient intake of protein (essential for growth) is a risk for wasting and stunting. It also has an impact on micronutrient intake as protein foods are rich sources of vitamins and minerals.
Deficiencies in micronutrients, such as vitamin A and iron, over a long period of time, lead to chronic undernutrition. Iron deficiency leads to anaemia and Vitamin A deficiency leads to blindness and interferes with the normal functioning of the immune system, growth and development as well as reproduction.
This tool chooses to focus on three key nutrients; Protein, Vitamin A and Iron (hem iron) primarily for their nutritional importance but also those foods rich in these nutrients can be easily grouped from food consumption data.

The survey results showed under Acceptable Food consumption score _Nutrition majority consumed Vitamin A rich foods and Protein rich foods. For the poor/ borderline food consumption score, 72.3% consumed Vitamin A rich foods while only 11.8% of the respondents consumed protein rich foods while 2.70% consumed the hem iron-rich foods for 7 days. This is as shown in the graph below:

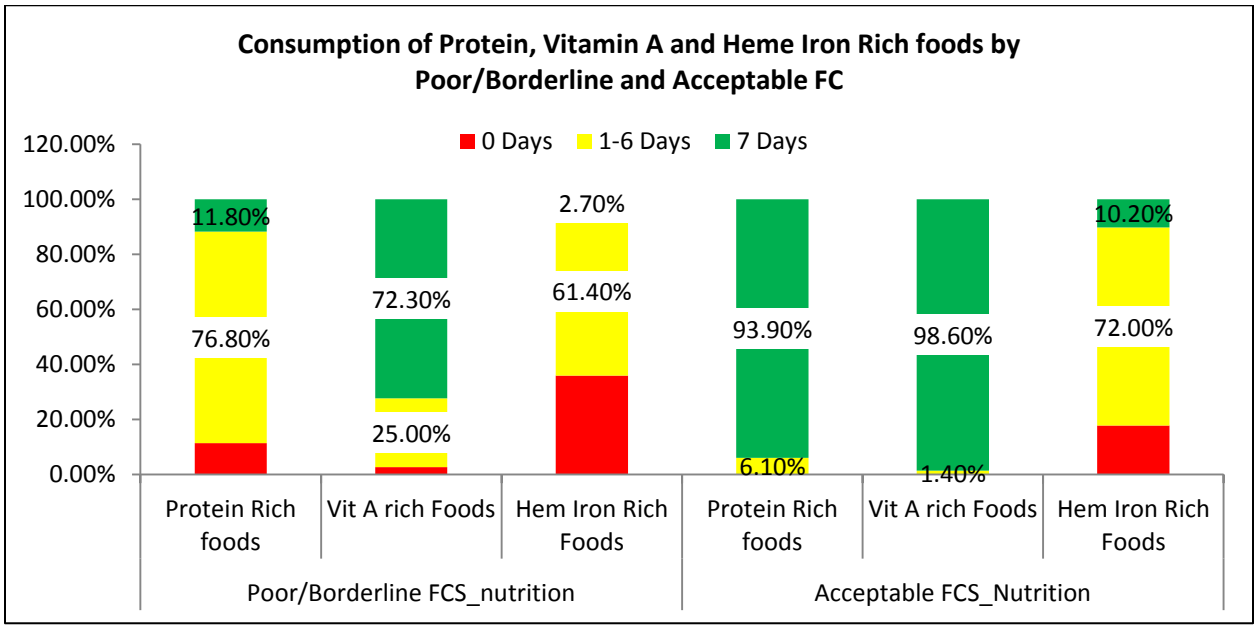


FIGURE 19: FOOD CONSUMPTION SCORE _NUTRITION

FOOD FORTIFICATION

Fortification is adding vitamins and minerals to foods to prevent nutritional deficiencies. The nutrients regularly used in grain fortification prevent diseases, strengthen immune systems, and improve productivity and cognitive development. Wheat flour, maize flour, and rice are primarily fortified to:

- Prevent nutritional anemia
- Prevent birth defects of the brain and spine
- Increase productivity
- Improve economic progress

Fortification is successful because it makes frequently eaten foods more nutritious without relying on consumers to change their habits.
With regard to the survey 26.8% (n=256) household reported to have heard about Food fortification with 24.6% through the radio and 18.4 % through TV show. Out of 26.8% household who had heard about food fortification, 51.2% (132) were able to identify the Food fortification Logo.
In addition only 15.2% (145) of households were aware that the Maize Flour they consumed was fortified with main sources of Maize flour being shops and supermarket.
This is as shown in the graphs below:

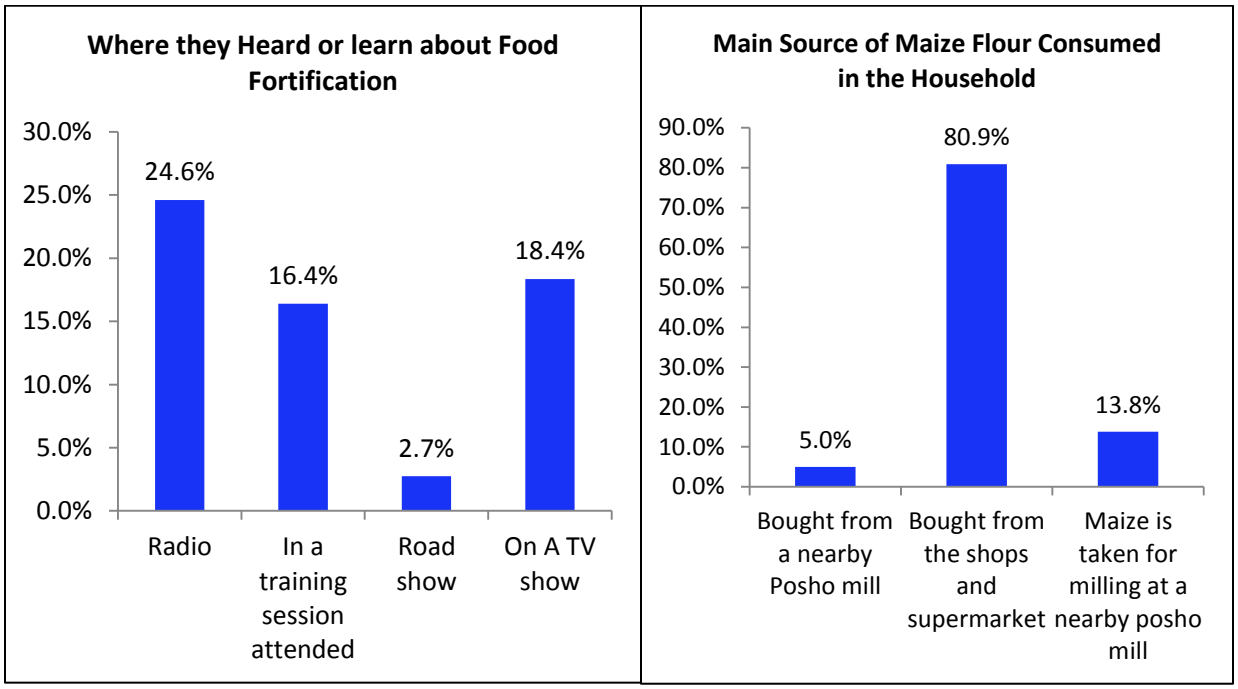


FIGURE 20: FOOD FORTIFICATION AND SOURCE OF MAIZE FLOUR

COPING STRATEGY INDEX

The Coping Strategy Index (CSI), a tool developed by the World Food Programme, is commonly used as a proxy indicator for access to food[25].It is a weighted score that allows one to measure the frequency and severity of coping strategies. Data is collected on the number of days in the last seven days a household used a specific coping strategy due to a shortage of food and/or income.

The mean coping strategy Index for Nairobi County was 13.07 with most at 93.8% relying on less preferred and less expensive food followed by limiting portion size. This is as summarized in the table below:

[25] Access to food' is just one of the three pillars of food security. Other pillars include, 'food availability' and 'food utilization'.

TABLE 18: COPING STRATEGY INDEX

Coping strategy	Proportion of HHs (N=)	Frequency score (0-7)	Severity score (1-3)	Weighted score=Freq*weight 2017
Rely on less preferred & less expensive food	93.8%(451)	2.77	1	2.77
Borrow food	50.9%(245)	1.10	2	2.20
Limit portion sizes	74.2%(357)	2.23	1	2.23
Restrict consumption of food by adults for young children to eat	53.2%(256)	1.31	3	3.93
Reduced number of meals	64.0%(308)	1.94	1	1.94
Total weighted Coping Strategy Score				**13.07**

CONCLUSIONS AND RECOMMENDATIONS

Results	Recommendation	By Whom	Timeline
High Stunting Rates	BFCI Intervention is recommended which include: breastfeeding, complementary feeding, maternal nutrition (using locally available foods) and environmental sanitation and personal hygiene. This integrated approach emphasizes the linkages between maternal and infant nutrition, and a clean environment. Training of health workers and community units(Community Health Committees, Community Health Extension Workers and Community Health Volunteers)	County Health Team Management and the Implementing Partners.	September 2017
Low Knowledge on MNPs	Health education and sensitization on MNPs to be done at both community and health facility level. Stocks are available but community members were not aware.	County Health Team Management and the Implementing Partners.	Continuous
Handwashing at critical times was very low.	Conduct/scale up health education targeting behaviour change on part of handwashing at critical times.	County Health Team Management and the Implementing Partners.	Continuous
Increase in Diarrhea Cases	Treatment of water at strategic water points and households being done in Mukuru, Kibera and Korogocho which were identified as Hotspots. Continuous distribution of water purification products. Distribution of the following Commodities • Aqua tabs • ORS • Zinc tablets	County Health Team Management and the Implementing Partners.	Immediately
Vitamin A data was not getting to the DHIS	Data quality audits to be emphasized in order to improve the quality of DHIS reporting. Vitamin A was doing well based on population/survey data. However, DHIS data shows very low rates.	County Health Team Management and the Implementing Partners.	Planned Next Quarter
The high dietary diversity score does not mean good feeding practices are being embraced at community level.	Education on proper feeding to be emphasized especially using Community Conversation Approach.	County Health Team Management and Implementing Partners	Continuous
Low Knowledge on Food fortification	Health education and sensitization on MNPs to be done at both community and health facility level	County Health Team Management	June 2017
Low usage of Iron folic and acid supplementation	Education on the advantages of taking the IFAs supplementation during pregnancy. At the community and at the facility level.	County Health Team Management and Implementing Partners	Continuous

APPENDICIES

APPENDIX 1: PLAUSIBILITY RESULTS

Indicator	Acceptable values/range	Nairobi County
Flagged data (% of out of range subjects)	<7.5	0 (2.1 %)
Overall sex ratio (significant CHI square)	>0.001	0 (p=0.375)
Age ratio (6-29vs 30-59) Significant CHI square	>0.001	10 (p=0.000)
Dig. prevalence score-weight	<20	0 (3)
Dig. prevalence score-height	<20	0 (7)
Dig. prevalence score-MUAC	<20	0 (4)
Standard Dev. Height WHZ	>0.80	0 (1.05)
Skewness WHZ	<±0.6	0 (-0.15)
Kurtosis WHZ	<±0.6	0 (0.05)
Poisson WHZ -2	>0.001	0 (p=0.501)
OVERALL	<24	10% (Good)

APPENDIX 2: CALENDAR OF LOCAL EVENTS

	Seasons	2012	2013	2014	2015	2016	2017
JANUARY	New year		52	40	28 Construction of Outering road	16 Fidel Odinga's death	4
FEBRUARY			51	39	27	15	3
MARCH			50 General elections	38	26	14	2
APRIL			49 Mutula Kilonzo's death/ Uhuru's inaguration	37	25 Garrissa Univ. terror attack/ NYS scandal released	13 Lucy Kibaki's death/ Huruma tragedy/ floods/ Uhuru ICC case ends/	1
MAY	Labour day		48	36	24	12 IEBC demos in Nairobi/ Jacob Juma's death	0
JUNE		59 Saitoti's death	47	35 World cup in Brazil	23	11 Teachers strike	
JULY	Eid celebrations	58 London oLympics	46	34	22 Obama visit to Kenya	10	
AUGUST		57	45	33	21	9 Burning of schools by students/ Rio Olympics	
SEPTEMBER		56	44 Westgate terror attack	32	20	8 Ole Ntimama's death/ KDF attack by Al Shabaab	
OCTOBER	Mashujaa day	55	43	31	19	7	
NOVEMBER		54	42	30 Otieno Kajwang death	18 Doctors Strike	6 Pope's visit/ Doctror's strike/ U.S elections/	
DECEMBER	Christmas	53	41 World AIDS day/ Mandela's death	29	17	5	

APPENDIX 3: CLUSTERS VISITED

VILLAGE NAME	CLUSTER NAME	VILLAGE NAME	CLUSTER NAME
Kingstone	1	Kichijio	36
Donholm	2	Mashimoni	37
Jaimaica	3	Lindi	38
Sinai	4	Gatwekera B	39
Paradise	5	Makina A	40
Bin	6	Gitathuru	41
Feed the Children A	7	Highridge	42
Egesa	8	Ngomongo A	43
Simba Colt	9	Ngomongo B	44
Falcon C	10	Grogan A	45
Feed the Children B	11	Grogan B	46
Kosovo A	12	Nyayo	47
Mombasa	13	Kisumu Ndogo	48
Railway A	14	Korogocho A	49
Railway B	15	Korogocho B	50
Riara 1	16	Mlango Kubwa	51
Riara B	17	Kosovo	52
Rurie	18	Mathare 4B	53
Gatope	19	Mathare 3C	54
Wesinya	20	Mathare 10	55
Githogoro	21	Kiamaiko	56
Moslem	22	Kinyago	57
Gatina	23	Kibarage	58
Congo	24	GMA	59
Kanungagu	25	GMC Gitare	60
Kware	26	Kitui	61
Barcelona	27	Shauri Moyo	62
Nyogora	28	Kosovo	63
Centre	29	Mabatini	64
Kibagare	30	Bahati	65
Soweto West	31	Shauri Yako	66
Decanty	32	Gitau	67
Gatwekera A	33	Mworoto	68
Silanga	34	Muthaiga	69
Kianda	35	Riverbank	70

APPENDIX 4: QUESTIONNAIRES

NAIROBI SLUMS INTEGRATED SMART HEALTH & NUTRITION SURVEY QUESTIONAIRE

1.IDENTIFICATION ----------	**1.1 Data Collector_____**	**1.2 Team Leader_____**	**1.3 Survey date (dd/mm/yy)-**					
1.4 County	1.5 Sub County	1.6 Ward	1.7 Location	1.8 Sub-Location	1.9 Village	1.10 Cluster No	1.11 HH No	1.12 Team No.
1.13 Household geographical coordinates	**Latitude**	_____	**Longitude**	_____				

		2. Household Demographics								
2.1	**2.2a**	**2.2b**	**2.3**		**2.4**	**2.5**	**2.6**	**2.7a**	**2.7b**	**2.8**	**2.10**
Age Group	**Please give me the names of the persons who usually live in your household.**	**Please indicate the household head (write HH on the member's column)**	**Age (Record age in MONTHS for children <5yrs and YEARS for those ≥ 5 years's)**		**Childs age verified by** 1=Health card 2=Birth certificate / notification 3=Baptism card 4=Recall 5. other _____ specify	**Sex** 1= Male 2= Female	**If between 3 and 18 years old, Is the child attending school?** 1 = Yes 2 = No (If yes go to 2.8; If no go t o 2.7)	**Main reason for not attending school (Enter one code from list)** 1=Chronic Sickness 2=Weather (rain, floods, storms) 3=Family labour responsibilities 4=Working outside home 5=Teacher absenteeism/lack of teachers 6= Fees or costs 7=Household doesn't see value of schooling 8 =No food in the schools 9 = Migrated/ moved from school area (including displacements) 10=Insecurity/ violence 11-No school Near by 12=Married	**2.7a, What is the child doing when not in school?** **1**=Working on family farm 2=Herding Livestock 3=Working for payment away from home 4=Left home for elsewhere 5=Child living on the street 6: Other specify _____	**What is the highest level of education attained?(level completed) From 5 yrs and above** 1 =Pre primary 2= Primary 3=Secondary 4=Tertiary 5= None 6=others(specify) Go to question to 2.9 ↓	**If the household owns mosquito net/s, who slept under the mosquito net last night? (***Probe- enter all responses mentioned (Use 1 if "Yes" 2 if "No and 3 if not applicable) go to question 2.11*
			Years	Months							

								13. Pregnant/ taking care of her own child 13=others (specify)…… ……..			
< 5 YRS	1										
	2										
	3										
	4										
>5 TO <18 YRS	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
ADULT (18 years and above)	13										
	14)										
	15										
	16										

2.9	**How many mosquito nets does this household have? _____ (Indicate no.) go to question 2.10 before proceeding to question 2.11**	
2.11	**Main Occupation of the Household Head – HH.** **(enter code from list)** 1=Livestock herding 2=Own farm labour 3=Employed (salaried) 4=Waged labour (Casual) 5=Petty trade 6=Merchant/trader 7=Firewood/charcoal 8=Fishing **9=** Income earned by children	**2.12.** What is the **main** current source of income **of the household?** 1. =No income 2. = Sale of livestock 3. = Sale of livestock products 4. = Sale of crops 5. = Petty trading e.g. sale of firewood 6. =Casual labor 7. =Permanent job 8. = Sale of personal assets 9. = Remittance 10. Other-Specify |____|

	10=Others (Specify) |____|	
2.13	Marital status of the respondent 1. = Married 2. = Single 3. = Widowed 4. = separated 5. = Divorced. |____|	**2.14. What is the residency status of the household**? 1. IDP 2.Refugee 3. Resident |____|
2.15	Are there children who have come to live with you recently? 1. YES 2. NO	2.15b If yes, why did the child/children come to live with you? 1= Did not have access to food 2=Father and Mother left home 3=Child was living on the street, 4=Care giver died 5= Other specify _____

Fever with Malaria: High temperature with shivering	**Cough/ARI:** Any episode with severe, persistent cough or difficulty breathing	**Watery diarrhoea:** Any episode of three or more watery stools per day	**Bloody diarrhoea:** Any episode of three or more stools with blood per day

3.	**4.**	**5. CHILD HEALTH AND NUTRITION (ONLY FOR CHILDREN 6-59 MONTHS OF AGE; IF N/A SKIP TO SECTION 3.6)** **Instructions:** *The caregiver of the child should be the main respondent for this section* ***3.1 CHILD ANTHROPOMETRY*** ***3.2 and 3.3 CHILD MORBIDITY*** *(**Please** fill in **ALL REQUIRED** details below. Maintain the same child number as part 2)*

A **Child No.**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**3.2 a**	**3.2 b**	**3.3 a**	**3.3 b**	**3.3 c**
	what is the relationship of the respondent with the child/children 1=Mother 2=Father 3=Sibling 4=Grandmother 5=Other (specify)	SEX Female ……F Male ……..…M	Exact Birth Date	Age in months	Weight (KG) XX.X	Height (CM) XX.X	Oedema Y= Yes N= No	MUAC (cm) XX.X	Is the child in any nutrition program 1. Yes 2. No If no skip to questions 3.2	If yes to question J. which nutrition program? 1.OTP 2.SFP 3.BSFP Other Specify _____	Has your child (NAME) been ill in the past two weeks? 1.Yes 2. No If No, skip to 3.4	If YES, which illness (multiple responses possible) 1 = Fever with chills like malaria 2 = ARI /Cough 3 = Watery diarrhoea 4 = Bloody diarrhoea 5 = Other (specify) *See case definitions above*	**When the child was sick did you seek assistance?** 1.Yes 2. No	**If the response is yes to question # 3.2 where did you seek assistance? (More than one response possible-** 1. Traditional healer 2.Community health worker 3. Private clinic/ pharmacy 4. Shop/kiosk 5.Public clinic	If the child **had watery diarrhoea** in the last TWO (2) WEEKS, did the child get: 1. ORS 2. Zinc supplementation? *Show sample and probe further for this component* *check the remaining drugs(confirm from mother child booklet)*

														6. Mobile clinic 7. Relative or friend 8. Local herbs 9.NGO/FBO	
01															
02															
03															
04															

3.4 Maintain the same child number as part 2 and 3.1 above

	A1	**A2**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Child No.	How many times has child received Vitamin A in the past year? (show sample)	Has the child received vitamin A supplement in the past 6 months?	How many times did the child receive vitamin A capsules from the facility or out reach	If Vitamin A received how many times in the past one year did the child receive verified by **Card?**	**FOR CHILDREN 12-59 MONTHS** How many times has child received drugs for	Has the child received BCG vaccination? Check for BCG scar. **1 = scar** **2=No scar**	Has child received OPV1 vaccination **1=Yes, Card** **2=Yes, Recall** **3 = No** **4 = Do not know**	Has child received OPV3 vaccination? **1=Yes, Card** **2=Yes, Recall** **3 = No** **4 = Do not know**	Has child received measles vaccination at 9 months *(On the upper right shoulder)?* **1=Yes, Card** **2=Yes, Recall** **3 = No** **4 = Do not**	Has child received the second measles vaccination (18 to 59 months) *(On the upper right shoulder)?* **1=Yes, Card** **2=Yes, Recall** **3 = No**

					worms in the past year? *(show Sample)*				**know**	**4 = Do not know**
01										
02										
03										
04										

3.5 MNP Programme Coverage.

Maintain the same child number as part 2 and 3.1 above. Ask all the relevant questions (3.5.1 to 3.6.4) before moving on to fill responses for the next child. THIS SECTION SHOULD ONLY BE ADMINISTERED IF MNP PROGRAM IS BEING IMPLEMENTED OR HAS BEEN IMPLEMENTED

	3.5 Enrolment in an MNP program		**3.6 Consumption of MNPs**			
	3.5.1. Is the child enrolled in the MNP program?(show the example of the MNP sachet) ***(record the code in the respective child's number)*** Yes =1 No=0 **If no go to 3.5.2,** **If yes go to section 3.6.1**	3.5.2 If the child, 6-23months, is not enrolled for MNP, give reason. (***Multiple answers possible. Record the code/codes in the respective child's number. DO NOT READ the answers)*** Do not know about MNPs ……1 Discouraged from what I heard from others ……..2 The child has not fallen ill, so have not gone to the health facility …. ……..3 Health facility or outreach is far ……4 Ch ild receiving therapeutic or supplementary foods .....5 Other reason, specify ..……..……6 ***Skip to 3.7***	3.6.1 Has the child consumed MNPs in the last 7 days?(shows the MNP sachet) ***(record the code in the respective child's number)*** YES = 1 N0= 0 ***If no skip to 3.6.3***	3.6.2 If yes, how frequent do you give MNP to your child? ***(record the code in the respective child's number)*** Every day ……..……1 Every other day .....……..2 Every third day ……..……..3 2 days per week at any day ....4 Any day when I remember.....5	3.6.3 If no, since when did you stop feeding MNPs to your child? ***(record the code in the respective child's number)*** 1 week to 2 weeks ago ....1 2 week to 1 month ago ....2 More than 1 month 3	3.6.4 What are the reasons to stop feeding your child with MNPs? (***Multiple answers possible. Record the code/codes in the respective child's number. DO NOT READ the answers)*** Finished all of the sachets .....1 Child did not like it .....2 Husband did not agree to give to the child .....3 Sachet got damaged ……4 Child had diarrhea after being given vitamin and mineral powder ……..5 Child fell sick.....6 Forgot ……..7 Child enrolled in IMAM program …8 Other (Specify)_____ ..9

Child 1						
Child 2						
Child 3						
Child 4						

MATERNAL NUTRITION FOR WOMEN OF REPRODUCTIVE AGE (15-49 YEARS)*(Please insert appropriate number in the box)*									
3.7	**3.8**	**3.9**	**3.10**			**3.11**			
Woman ID. **(all women in the HH aged 15-49 years from the household demographics – section 2)**	What is the mother's / caretaker's physiological status **1. Pregnant** **2. Lactating** **3. not pregnant and not lactating** **4. Pregnant and lactating**	Mother/ caretaker's MUAC reading: ____.__**cm**	During the pregnancy of the (name of the youngest biological child below 24 months) did you take the following supplements? indicate **1. Yes** **2. No** **3. Don't know** **4. N/A**			If Yes, for how many days did you take? (***probe and approximate the number of days***)			
			Iron tablets syrup	Folic acid	Combined iron and folic acid supplements	Iron tablets syrup	Folic acid	Combined iron and folic acid supplements	

	4.0 WATER, SANITATION AND HYGIENE (WASH)/- *Please ask the respondent and indicate the appropriate number in the space provided*		
4.1	**What is the MAIN source of drinking water for the household <u>NOW</u>?** **piped water** piped into dwelling .....11 piped to yard / plot .....12 piped to neighbour .....13 public tap / standpipe .....14 tube well / borehole .....21 **dug well** protected well .....31 unprotected well .....32 **spring** protected spring .....41 unprotected spring .....42 rainwater .....51 tanker-truck .....61 cart with small tank .....71 water kiosk .....72 surface water (river, dam, lake, pond, stream, canal, irrigation channel) .....81 **packaged water** bottled water .....91 sachet water .....92 1.	**4.2 a What is the trekking distance to the current main water source?** 1=less than 500m (Less than 15 minutes) 2=more than 500m to less than 2km (15 to 1 hour) 3=more than 2 km (1 – 2 hrs) 4=Other(specify) |____|	4.2b – Who MAINLY goes to fetch water at your current main water source? 1=Women, 2=Men, 3=Girls, 4=Boys
4.2.2a	**How long do you queue for water?** 1. Less than 30 minutes 2. 30-60 minutes 3. More than 1 hour 4. Don't que for water 1.	**.3 Do you do anything to your water before drinking? (*MULTIPLE RESPONSES POSSIBLE) (Use 1 if YES and 2 if NO*).** |____| 1. Nothing 2. Boiling…… …… |____| 3. Chemicals (*Chlorine,Pur,Waterguard*)…… |____| 4. Traditional herb……... |____| 5. Pot filters…….. |____| 5.	

4.3a	|____|	**6.**

4.4	**Where do you store water for drinking?** 1. Open container / Jerrican 2. Closed container / Jerrican |____|	**4.5 How much water did your household use YESTERDAY (excluding for animals)?** *(Ask the question in the number of 20 liter Jerrican and convert to liters & write down the total quantity used in liters)* |____|	
4.6	**Do you pay for water?** 1. Yes 2. No (**If No skip to Question 4.7.1**) |____|	**4.6.1 If yes, how much per 20 liters jerrican** _____ **KSh/20ltrs**	**4.6.2 If paid per month how much** |____|

4.7.1a	We would like to learn about where members of this household wash their hands. Can you please show me where members of your household <u>most often</u> wash their hands? *Record result and observation.* **OBSERVED** FIXED FACILITY OBSERVED (SINK / TAP) IN DWELLING..... 1 IN YARD /PLOT ..... 2 MOBILE OBJECT OBSERVED (BUCKET / JUG / KETTLE).....3 NOT OBSERVED NO HANDWASHING PLACE IN DWELLING / YARD / PLOT .....4 NO PERMISSION TO SEE..... 5	4.7.1b Is soap or detergent or ash/mud/sand present at the place for handwashing? YES, PRESENT.....1 NO, NOT PRESENT .....……**2**

4.7.1	**Yesterday (within last 24 hours) at what instances did you wash your hands? (MULTIPLE RESPONSE-** (Use 1 if "Yes" and 2 if "No") 1. After toilet…… 2. Before cooking…….... |____| 3. Before eating…… 4. After taking children to the toilet……. |____| 5. Others…… |____| |____| |____|	
4.7.2	**If the caregiver washes her hands, then probe further; what did you use to wash your hands?** 1. Only water 2. Soap and water	**4.8 What kind of toilet facility do members of your household usually use?**

	3. Soap when I can afford it 4. traditional herb 5. Any other specify |____|	**If 'Flush' or 'Pour flush', probe:** **Where does it flush to?** |____| **If not possible to determine, ask permission to observe the facility.** **flush / pour flush** **flush to piped sewer system 11** **flush to septic tank 12** **flush to pit latrine 13** **flush to open drain 14** **flush to DK where 18** **pit latrine** **ventilated improved pit latrine 21** **pit latrine with slab 22** **pit latrine without slab / open pit 23** **composting toilet 31** **bucket 41** **hanging toilet / hanging latrine 51** **no facility / bush / field 95** 1. **OTHER (specify) 96**

5.0: Food frequency and Household Dietary Diversity

Type of food*	**Did members of your household consume any food from these food groups in the last** *7 days?(food must have been cooked/served at the household)* ***0-No*** ***1-Yes***	**If** *yes*, **mark days the food was consumed in the last 7 days?** ***0-No*** ***1-Yes***								What was the **main** source of the dominant food item consumed in the HHD? **1.Own production** **2.Purchase** **3.Gifts from friends/families** **4.Food aid** **5.Traded or Bartered** **6.Borrowed** **7.Gathering/wild fruits** **8.Other (specify)**	**WOMEN DIETARY DIVERSITY** **ONLY FOR WOMEN AGE 15 TO 49 YEARS. REFER TO THE HOUSEHOLD DEMOGRAPHICS SECTION Q2.3 AND Q2.5** **Please describe the foods that you ate or drank yesterday during day and night at home or outside the home (start with the first food or drink of the morning)** ***0-No*** ***1-Yes***			
		D1	***D2***	**D 3**	**D 4**	**D5**	**D 6**	**D7**	**TOTAL**		Woman ID……	Woman ID……..	Woman ID …….	Woman ID……..
5.1. Cereals and cereal products *(e.g. sorghum, maize, spaghetti, pasta, anjera, bread*)?														
5.2. Vitamin A rich vegetables and tubers: Pumpkins, carrots, orange sweet potatoes														
5.3. White tubers and roots: White potatoes, white yams, cassava, or foods														

made from roots														
5.4 Dark green leafy vegetables: Dark green leafy vegetables, including wild ones + locally available vitamin A rich leaves such as cassava leaves etc.														
5.5 Other vegetables *(e.g., tomatoes, egg plant, onions)?*														
5.6. Vitamin A rich fruits: + other locally available vitamin A rich fruits														
5.7 Other fruits														
5.8 Organ meat (iron rich): Liver, kidney, heart or other organ meats or blood based foods														
5.9. Flesh meats and offals: Meat, poultry, offal *(e.g. goat/camel meat, beef; chicken/poultry)?*														
5.10Eggs?														
5.11Fish: Fresh or dries fish or shellfish														
5.12Pulses/legumes, nuts *(e.g. beans, lentils, green grams, cowpeas)*?														
*5.13*Milk and milk products *(e.g. goat/camel/ fermented milk, milk powder)?*														
5.14Oils/fats *(e.g. cooking fat or oil, butter, ghee, margarine)?*														
5.15Sweets: Sugar, honey, sweetened soda or sugary foods such as chocolates, sweets or candies														

5.16Condiments, spices and beverages:														

	4.1 FOOD FORTIFICATION (FF)/- *Please ask the respondent and indicate the appropriate number in the space provided*	
1.1	**Have you heard about food fortification?** 1. Yes 2. No 3. Don't know	
1.1.1	**If yes, where did you hear or learn about it? (MULTIPLE RESPONSE ARE POSSIBLE-** (Use 1 if "Yes" and 2 if "No") 6. Radio…… 7. Road show……... |____| 8. In a training session attended……. 9. On a TV show……. |____| 10. Others……. |____| |____| |____|	
1.2	**Respondent's knowledge on the food fortification logo (Show the food fortification logo to the respondent and record the response). Do you know about this sign?** 1. Yes 2. No 3. Don't know	|____|
1.3	**What is the MAIN source of Maize flour for the household <u>NOW</u>?** 2. Bought from the shops, supermarket e.t.c 3. Maize is taken for milling at a nearby Posho Mill 4. Bought from a nearby Posho Mill 5. Other *(Please specify)* |_____|	**1.1b Do you know if the maize flour you consume is fortified or not?** 1. Yes 2. No 3. Don't know
1.4	**What brands of the following foods does your household consume?** 1. Maize flour 2. Wheat flour 3. Margarine 4. Oils 5. Fats 6. Sugar	|_____| |_____| |_____| |_____| |_____|

		|_____|

6. COPING STRATEGIES INDEX		
		Frequency score: Number of days out of the past seven (0 -7).
	In the past 7 DAYS, have there been times when you did not have enough food or money to buy food? If No; END THE INTERVIEW AND THANK THE RESPONDENT **If YES, how often has your household had to:** *(INDICATE THE SCORE IN THE SPACE PROVIDED*)	
1	Rely on less preferred and less expensive foods?	
2	Borrow food, or rely on help from a friend or relative?	
3	Limit portion size at mealtimes?	
4	Restrict consumption by adults in order for small children to eat?	
5	Reduce number of meals eaten in a day?	
	TOTAL HOUSEHOLD SCORE: **END THE INTERVIEW AND THANK THE RESPONDENT**	