

SUMMARY OF KEY FINDINGS

- The GAM prevalence rates in Mathare slums based on 5% threshold indicate low probability of exceeding this threshold in all the three rounds of surveys with probability of 39% in January and April and 72% in July. However, considering the population density in the area, the absolute case number expected is high and would justify nutrition interventions.
- Infant and Young Child Feeding practices are generally poor in Mathare slums. In addition, inadequate hygiene and sanitation coupled with unhygienic environment are the major causes of concern for high rates of morbidity that lead to acute malnutrition.
- In Mathare slum, household income is the most important determinant to access food and a considerable share of the income (42 to 50%) is spent on food. Given the increasing trend in the price of food commodities, slum dwellers particularly the poorest and female headed households, are highly vulnerable to food insecurity and malnutrition.
- Based on the 12 food groups, the mean diet diversity score was 6.4, 6.3 and 6.2 in January, April and July, respectively, which can be considered medium. However, the consumption of protein rich foods like eggs, fish and meat was very low, an indicator of high risk of protein energy malnutrition.

1. INTRODUCTION

Urban food insecurity has become a growing humanitarian problem in most developing countries due to population increase, rural-urban migration, widespread poverty and increasing cost of food. In Kenya, an estimated 12 million people live in urban areas of which 5.7 million (about 48%) reside in slums or informal settlements¹. The slums are particularly at high risk of vulnerability to food insecurity and child malnutrition and therefore require close monitoring of the situation. Building on its experience since 2005 in monitoring the nutritional and food security situation in the North Eastern Province through annual nutritional surveys, ACF undertakes a Food Security and Nutrition Surveillance system in Mathare, the second largest slum in Nairobi.

The integrated quarterly surveillance was piloted in January 2009 in collaboration with the Ministry of Health and Nairobi City Council in Mathare slum which was chosen as representative of the poorest urban areas of Nairobi. The second surveillance round was implemented in April and the third round in July. The data collection for the latest round was conducted from July 17-20, 2009, preceded by a two-day training of data collectors.

2. METHODOLOGY

The surveillance was conducted using Probability Proportional to Population Size (PPS) sampling with 33x6 two-stage cluster design.

The PPS was applied for first stage cluster² selection using ENA for SMART software and at the second stage compounds and households were selected using a modified system of the EPI random walk method.

The sample included a minimum of 198 children and/or households in each of the survey rounds. Data on anthropometric measurements of children 6-59 months of age as well as additional household level data on health, water, sanitation, hygiene, food security and livelihoods were collected. The results for the third round of the surveillance and comparing trends are presented in the following sections.

¹ Kenya Food Security Update, KFSSG, January 2009

² The clusters selected at the first round have been retained in the subsequent surveys

3. CHILD NUTRITIONAL STATUS

The anthropometric data was analyzed using ENA for SMART and the CDC risk calculator³. The findings based on probability of exceeding the 5% GAM thresholds indicate very low probability (39% in January and April) and for July higher but still below the 85% level as indicated in the table below. The comparisons of the main indicators of GAM and SAM based on 95% CI also showed no significant difference between the three surveys.

Table 1: GAM Rates and the Probability of exceeding the 5% thresholds (WHO standards)

	Jan-09	Apr-09	Jul-09
Sample Children	199	234	233
GAM- NCHS	4.5% [1.4%-7.7%]	4.3% [1.7%-6.9%]	5.2% [3.3%-8.7%]
SAM- NCHS	1.0% [0.0%-2.4%]	1.7% [0.0%-3.4%]	3.0% [1.0%-5.1%]
GAM- WHO	4.0% [0.9%-7.1%]	4.3% [1.5%-7.1%]	6.0% [2.6%-7.7%]
SAM- WHO	1.0% [0.0%-2.4%]	1.7% [0.0%-3.4%]	3.0% [1.0%-5.1%]
Probability of exceeding the 5% GAM threshold-WHO	0.39	0.39	0.72

* Figures in brackets are 95% confidence intervals and slightly different from previously reported due to larger number of inclusion by using the new CDC risk calculator instead of decision rule.

An estimated population of 118,000⁴ was covered in the sentinel site and with 20% of population being less than 5 years of age, 23,600 children are estimated to be living within Mathare sentinel site geographical area. The caseload (incidence in one year) of severe acute malnourished children in Mathare can be calculated at 1,132 children⁵. When considering that moderate acute malnutrition increases the risk of death by a factor of 4, and severe acute malnutrition by a factor 10⁶, it is evident that proper access to treatment for all acutely malnourished children is necessary.

4. CHILD MORBIDITY AND CARE PRACTICES

4.1. Child Morbidity

As compared to the two surveys done earlier in the year, a significant increase of coughing cases was recorded in July. However, this could be a result of the cold season experienced in Nairobi during surveillance period. The prevalence of diarrhoea and fever with chills like malaria show an insignificant variation between seasons. These diseases reduce the appetite of young children as well as inhibit the absorption of nutrients, thus increase nutrient requirements in the body.

Comparative data from a local health facility shows a prevalence of the same top three childhood illnesses in the three months preceding the survey: coughs with difficulty in breathing (33%), fever with chills like malaria (31%) and diarrhoea (14%)⁷. An unclean environment and poor child care practices may have contributed to the high incidence of childhood diseases that in turn lead to malnutrition.

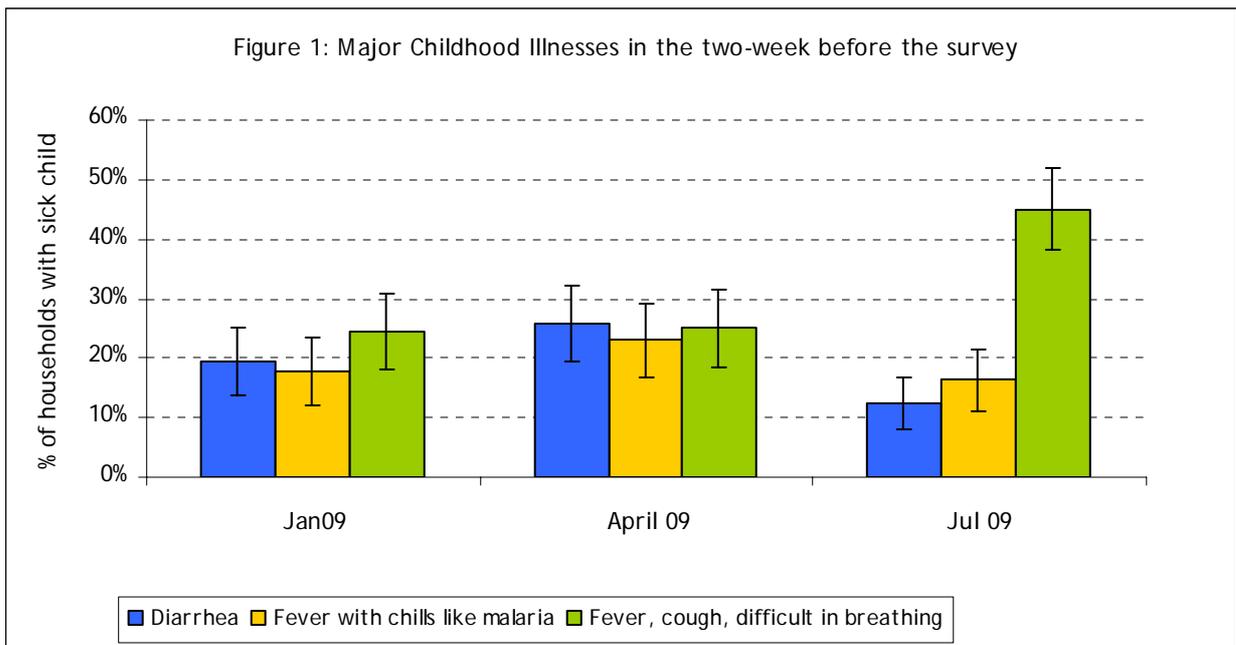
³ The CDC calculator was presented at Regional meeting in Nairobi organized by FSANU and UNICEF in June 2009 and agreed as an alternative tool for interpretation of the rates of acute malnutrition using a 85% probability

⁴ MSF-F May 2008

⁵ Michel Garenne, Douladel Willie, Bernard Maire, Olivier Fontaine, Roger Eeckels, André Briend and Jan Van den Broeck Incidence and duration of severe wasting in two African populations. *Public Health Nutrition*, Published online by Cambridge University Press 02 Mar 2009 doi:10.1017/S1368980009004972

⁶ C. Prudhon, A. Briend, D. Laurier, M. H. N. Golden and J. Y. Mary, "Comparison of Weight- and Height-based Indices for Assessing the Risk of Death in Severely Malnourished Children" <http://aje.oxfordjournals.org/cgi/content/abstract/144/2/116>

⁷ Source: Mathare North health centre (July 09)



4.2. Child Feeding and Care Practices

From the sampled caretakers⁸, initiation of breastfeeding within the first hour after delivery was reported by over 50% of households in the three surveys. However, a larger proportion of children were weaned from breast milk at less than 4 months of age: 66%, 59%, 64% for January, April and July, respectively. This continuous trend of poor results for exclusive breastfeeding highlights the need for extended health promotion activities in the slum, with a special focus on childcare and Infant and Young Child Feeding (IYCF) practices.

Significant contributing factors related to malnutrition in the area are children neglected by their working mothers⁹, inadequate weaning, poor personal and environmental hygiene, and economic factors. The situation becomes worse when it combines with other illnesses as can often precipitate clinical malnutrition including oedema because of associated diarrhoea, anorexia, vomiting, increased metabolic needs, and decreased intestinal absorption. Programs to raise awareness of the importance of good weaning practices, clean environments and personal hygiene need to be strengthened.

5. Water, Sanitation and Hygiene Practices

5.1. Water Sources and Use

Shared piped water supply by city council remains the chief source of water for domestic use. Whereas piped water from the city council is normally chlorinated and safe, post contamination occurs after fetching and especially during transportation, storage and handling remains the suspected source of water borne diseases. The average per capita water consumption per day was 21.7 [20.2-23.3], 19.9 [17.8-22.0] and 19.4 [18.4-21.4]¹⁰ in January, April and July, respectively. This is above the 15 litres/person/day SPHERE emergency standard. Generally the water consumption per household remained unchanged in Mathare¹¹ unlike other areas in Nairobi where water rationing is common and seasonal variation is expected.

⁸ The respondents include mothers with children <2 years and the sample caretakers in January (119), April (120) and July (91), respectively

⁹ During the surveys it was observed that some mothers were away from home to work leaving children unattended

¹⁰ Figures in bracket are 95% C.I.

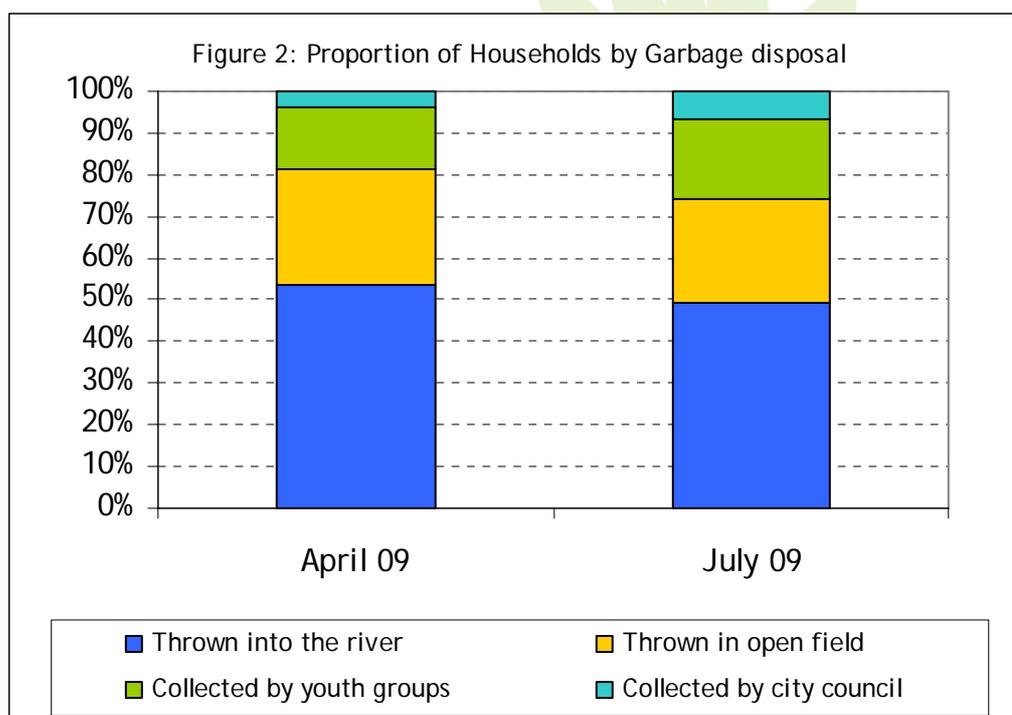
¹¹ Water for Mathare primarily comes from the nearby army barrack and freely accessible to the majority of the residents.

Majority of the households (over 62%), did not use any form of treatment to drinking water after drawing from the source. Considering poor water treatment practices, the predominantly unhygienic environment and improper water handling, diarrhoeal diseases are a significant risk factor in the area.

5.2. Latrine Use and Garbage disposal

Lack of basic sanitary facilities such as latrines, garbage disposal facilities, and sewerage and dust free environment is common in the area. About 13% of respondents in July confirmed that they defecate in the open or used plastic bags (the actual percentage is expected to be high due to suspected underreporting). Thus faecal matters still contaminate food, hygiene and homes, making infections and disease inevitable. The problem is aggravated by limited awareness and lack of hygiene practices, overcrowding and the absence of sewerage system. Nearly all latrine facilities are business entities¹² whereby one has to pay for use but due to inadequate income, most residents choose open defecation. Moreover, most of the available latrines (over 50%) were found to be unclean with presence of faeces on the slabs.

Poor human waste disposal and sewerage system pose a great threat to health and ultimately nutritional status of the children. Majority of the households' (59% and 52%) disposed their household garbage in the already contaminated Mathare River, while another sizable proportion (30% and 26%) disposed in the open field in April and July respectively (figure 2).

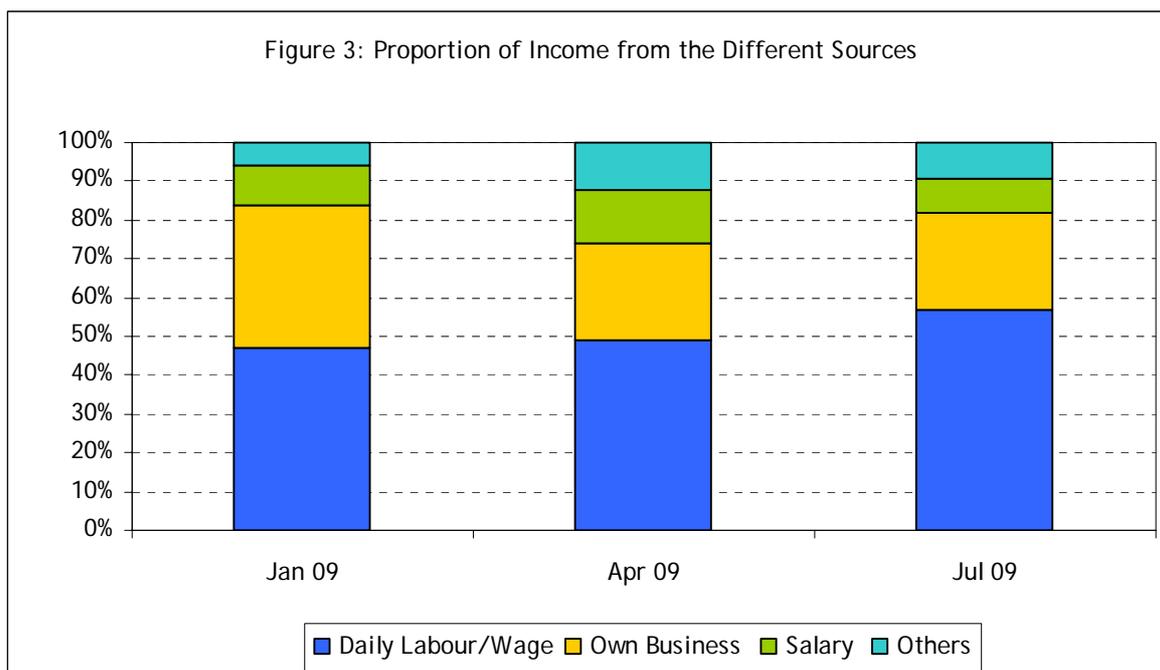


6. Food Security and Livelihoods

6.1. Main Occupation, Income and Expenditure

In Mathare slum the main occupation and source of income for the majority of households is casual labour followed by own business and salaried employment. About two-thirds of the household heads are employed as daily or casual laborers, one-quarter self-employed (own business) and about one-tenth salary employed. The two most important sources of income therefore, are casual labour and self employment, both accounting to 84%, 74% and 82% of the total income in January, April and July 2009, respectively.

¹² Care, Oxfam & Concern Worldwide report on informal settlements Nairobi April 2009



Taking into account the average family size during the respective surveys, the mean daily per capita income¹³ was equivalent to KSH 54, 81 and 85, which was higher than normally expected in the slums. The income data by quartiles indicate that the top 25% of the households' share was 50% of the income while the bottom 25% accounted to about 10% or less of the total income. Although the mean income was consistently higher than normally expected in the slums, which could partly be due to less homogeneity of Mathare dwellers, the bottom 25% of the households constitutes the most vulnerable group, earning an average per capita monthly income of KSH 1,020 and 1,110 (less than 0.5 dollar/day) in April and July 2009, respectively, well below the food poverty line of 1,474 KES/adult/month and overall poverty line of KES 2,913/adult/month, as defined by Kenya Bureau of Statistics¹⁴.

Among the occupation groups, the mean monthly income for the 30 days before the survey tend to be higher for own business and those on salaried employment. A further look at income by gender of the household head indicates that female headed households had lower income compared to their male counterparts (25% to 40% higher). This could indicate that the former could be more vulnerable and any intervention to improve livelihood or access to food should prioritize female headed households.

In terms of expenditure, food is the single most important expense accounting for nearly half the household expenses, 42%, 48% and 50% in January, April and July in that order followed by other basic necessities such as house rent, cooking fuel and transport/fare.

6.2. Sources of Food and Dietary Diversity

Purchase is the most important source of food for most households (96-99%), thus income is an important determinant to food access in the slum. Other sources such as own production, food aid and gift from friends or relatives play insignificant role. For example, in July only 5% of the households reported practicing some kind of urban gardening producing primarily Sukuma Wiki, Spinach and tomatoes, and of these 3.5% ranked own production as the second important source of food next to purchase.

The dietary diversity measured using the 12 main food groups and 24 hours recall period indicates a mean score of 6.4, 6.3 and 6.2 in January, April and July, respectively, which can be considered as medium. Looking into the specific food groups, the food types consumed by most households

¹³ The per capita income estimate was based on family size, not converted into adult equivalent since no detailed demographic data were collected. The median income for the respective period was KSH 47, 65 and 74 respectively.

¹⁴ Care, Oxfam & Concern report (April 2009)

(80-100%) include cereals, sugar, fat/oil and vegetables. The consumption of meat, eggs and fish (Table 2) which are priced higher¹⁵ and hence less affordable to the slum dwellers, was low. Lack of such animal proteins in diets poses a great risk of protein-energy malnutrition. Dietary diversity is also correlated to income, for instance, in July 2009; the top quartile consumed an average of 6.8 food groups compared to the bottom quartile with 5.4 food groups.

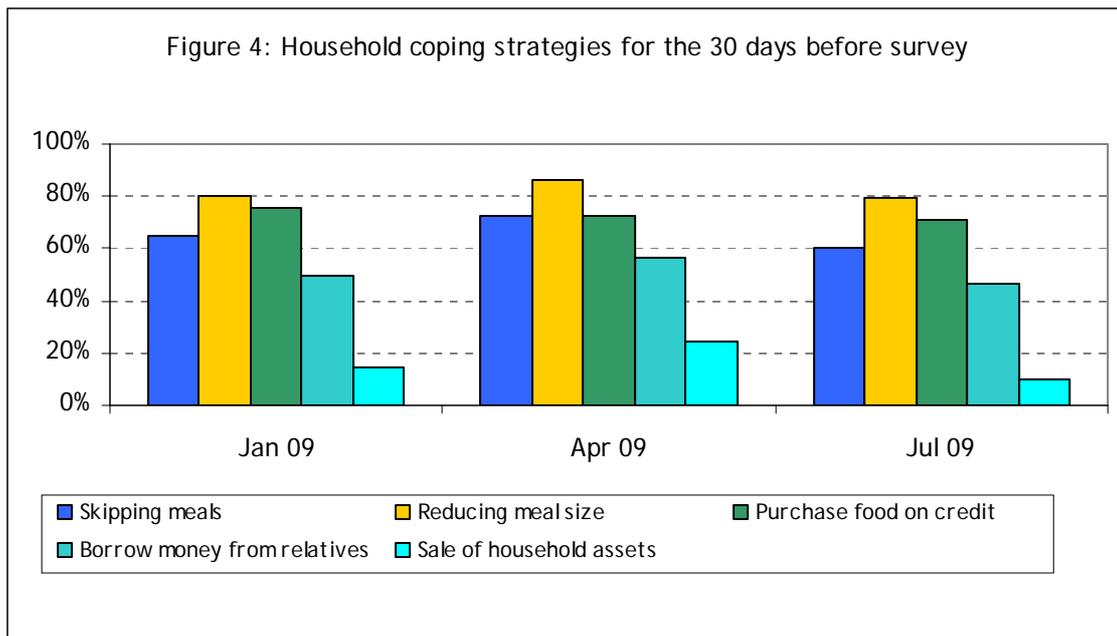
Table 2: Proportion of Households by Food Group Consumed

Food Group	Jan 09 (n=198)		Apr 09 (n=198)		Jul 09 (n= 202)	
	N	%	N	%	N	%
Cereals	196	99.0	198	100.0	200	99.0
Roots or tubers	44	22.2	20	10.1	49	24.3
Any vegetables	167	84.3	169	85.4	165	81.7
Fruits	74	37.4	45	22.7	37	18.3
Eggs	15	7.6	18	9.1	12	5.9
Meat	41	20.7	35	17.7	39	19.3
Fish	34	17.2	42	21.2	36	17.8
Beans, peas, lentils, or nuts	57	28.8	60	30.3	75	37.1
Milk or milk product	133	67.2	91	46.0	83	41.1
Fat or oil	158	79.8	182	91.9	176	87.1
Sugar or honey	175	88.4	192	97.0	184	91.1
Other condiments (e.g. coffee, tea)	169	85.4	188	94.9	187	92.6
Mean Diversity Score	6.4		6.3		6.2	

6.3. Coping Strategies

Slum dwellers use a range of coping strategies including reducing the size of the meals, skipping meals, purchasing food on credit from local vendors, borrowing money and selling household assets. However, the top three coping mechanisms used consistently by over 65% of the households and indicating the vulnerability of households to food insecurity and lower intakes of food include reducing meal size, skipping meals and purchasing food on credit (Figure 4).

¹⁵ Data collected on selected food items from local vendors in Mathare during the survey indicate that meat 210 KSH/kg, eggs 8 KSH/unit, maize flour 40 KSH/Kg and rice 68 KSH/Kg.



7. CONCLUSION

The GAM rate analysed through the CDC risk calculator and using a threshold of 5% GAM showed very low probability of exceeding the threshold in all the three rounds of survey. However, translated into a potential caseload of severely malnourished children (incidence = 1,132 children), it appears that the rates measured in Mathare are high enough to justify the development of an extended access to the treatment of acute malnutrition.

It is also evident that IYCF practices are poor in the slum area, in addition to inadequate hygiene and sanitation. The unhygienic environment coupled with limited awareness and poor hygiene practices is the major cause of concern for high rates of morbidity and the ensuing acute malnutrition. Proper preventive measures such as promotion of environmental hygiene, IYCF practices and access to health services need to be strengthened.

To address the escalating cost of food prices especially leafy vegetables in the urban slums, establishment and/or strengthening of urban gardening to ease the burden would have significant impact to ensure not only food security but also good nutritional status.

Based on the three rounds of surveillance implemented in Mathare since January this year, the acute malnutrition rate is not yet alarming, but most indicators already reveal a precarious situation. Any deterioration, for instance, induced by food price increase could have a dramatic impact on the food security and nutritional status of the population, particularly on children.