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Measuring Household Food Insecurity in Selected Local Government Areas of Lagos and Ibadan, Nigeria

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Abstract: Food security is defined in its most basic form as access to adequate, safe and nutritious food required for healthy and active life by all people at all times. Availability of food and access are two essential determinants of food security. A number of factors such as income, educational level, household sizes are known to affect household food security. Food insecurity, hunger and poverty are closely linked. The level of poverty in Nigeria is high and the percentage of food insecure households in Nigeria was reported to be 18% in 1986 and over 40% in 1998, the level in 2005 is not known. This study was therefore designed to assess the food security status of households in some selected local government areas in two of the large cities (Lagos and Ibadan) in Nigeria. A previous administration of this module suggested that food security is associated with income and the households studied here have steady and definable income. The study therefore was undertaken to describe the food security status of households headed or managed by teachers employed in secondary and primary, public and private schools. The study was descriptive and cross-sectional in design with a sample size of 482 households that were selected using random sampling techniques. The data were collected using an interviewer-administered questionnaire (USDA 18-Question Household Food Security Questionnaire Module). Descriptive statistics such as frequencies, means and standard deviation were employed in the analysis of the data. The results obtained from the study show that the prevalence of food security (26 per cent) in teachers' households in both Lagos and Ibadan was low and the food security status of the teachers' household in Lagos was better ($p<0.05$) than of households in Ibadan. The results of the study also identified income status and the educational status of the household head to influence the food security in those households. A household food insecurity of over 70% in this study is unacceptably high.

Key words: Household, food security, food insecurity

Introduction

Malnutrition continues to be a problem of public health importance despite the various interventions in the past two decades. High morbidity and mortality in children has been largely attributed to high prevalence of Protein-Energy Malnutrition (PEM), and micronutrient deficiencies (Agary and Gillespie, 1993; Federal Government of Nigeria and UNICEF, 1994; Maziya-Dixon *et al*., 2003; NPC and ORC Macro, 2004). While previous studies had focused on the prevalence of malnutrition, few had assessed the underlying causes: household food security, care and adequacy of health services and environment sanitation. The extent and degree of malnutrition as measured by the prevalence of wasting, stunting and underweight has been the usual method of assessing malnutrition in the past three decades. However, prevalence only measures the enormity or size of the problem. Few studies in the past in Nigeria had measured food intake and its contribution to the nutritional status on a national scale. Whereas food consumption studies provide means of assessing one of the immediate causes of malnutrition, adequacy or otherwise of dietary intake or food consumption is predicated on household food security. Furthermore, household food security status is one of the three underlying factors, which predispose to malnutrition; the others being "care" and access to health services and salutary and salubrious environment. There are few published works describing the food security status of households despite common believe that Nigeria is food insecure.

The food security status of households had been measured in large populations using several methodologies in many parts of the world. The United States of America household food security scale (HHFSS) module had been used successfully for several years to "measure" food security status of households in the United States of America and other countries of the world with adequate precision. The purpose of measuring household food security are many; it had been used to examine association between food insecurity and health outcomes in children (Cook *et al*., 2004), for developing programmes that contribute to health promotion (Piaseu and Mitchell, 2004) and more

Table 1: Household category

	State of Residence				Total	N (%)
	Lagos	N (%)	Ibadan	N (%)		
1-5 members	146	(58.4)	147	(63.4)	293	(60.8)
6-10 members	99	(39.6)	81	(34.9)	180	(37.3)
11-16 members	5	(2.0)	4	(1.7)	9	(1.9)
Total	250	(51.9)	232	(48.1)	482	(100.0)

Table 2: Household and Family size

	N	Minimum	Maximum	Mean	Std. Deviation
Household	482	1	16	5.31	2.109
Family	482	1	14	4.70	1.739

Table 3: Occupation of household heads

Occupation	State of Residence				Total	N (%)
	Lagos	N (%)	Ibadan	N (%)		
Artisan	11	(4.4)	9	(3.9)	20	(4.1)
Civil servants	161	(64.4)	156	(67.2)	317	(65.8)
Trading	30	(12)	39	(16.8)	69	(14.3)
Farming/ Fishing	1	(0.4)	4	(1.7)	5	(1.0)
Others	47	(18.8)	24	(10.3)	71	(14.7)
Total	250	(100.0)	232	(100.0)	482	(100.0)

importantly to measure the degree and extent of food insecurity in households in order to inform interventions that will be based on scientific findings and targeting to improve effectiveness of programmes. This HHFSS Module (the 18 Question instrument) is employed here to measure household food security status of teachers' households. A previous administration of this module suggested that food security is associated with income. This study therefore was designed to assess the food security status in households that are headed by teachers or where teachers are in charge of purchase and preparation of meals or in charge of family budget for food. As income had been found to be an important factor in household food security, a non-homogenous group with verifiable income was chosen. Teachers in primary and secondary schools were selected.

Materials and Methods

This study was descriptive and cross-sectional in design. It was carried out in three local government areas (LGA) in Lagos and three LGA in Ibadan. Participants were selected from six primary schools (3 private, 3 public) and fourteen (5 private and 9 public) secondary schools in Lagos and six primary schools (3 private, 3 public) and ten secondary (5 private and 5 public) schools in Ibadan.

Ibadan and Lagos are two of the large cities in the southwest of Nigeria.

Subjects: Participants were members of the households that had first-hand knowledge about purchase and preparation of foods and feeding the households. These households were those either headed by teachers or where teachers are in charge of purchase or food preparation.

Participant selection: From a list of twenty LGA in Lagos state, three were selected using a table of random numbers. Also three LGA were chosen from a list of six LGA in Ibadan metropolis. From each LGA, two primary schools were selected: one public, one private. From the 3 LGAs in Lagos, 14 secondary schools were selected: five private and nine public schools. In Ibadan 5 private and 5 public secondary schools were selected. Every one of these selections was done using a table of random numbers from a list of the schools in each LGA.

Ethical issues: At the local government headquarters, permission was obtained for the study and a list of all public and private primary and secondary schools was also obtained. At each of the participating and selected schools, the Head teacher and other teachers were informed about the objectives of the study and voluntary participation was canvassed. Informed consent was given by each of the participants. The protocol of the study was reviewed and approved by the Institutional Review Board of the University College Hospital /University of Ibadan.

Sample Size: The unit of study was the household, and

Table 4: Income status and Residence

Income (N)	Residence				Total	N (%)
	Lagos	N (%)	Ibadan	N (%)		
≥ N55,000.00	105	(45.5)	82	(37.1)	187	(41.4)
N 45-54,999.99	26	(11.3)	39	(17.6)	65	(14.4)
N 35-44,999.99	32	(13.9)	40	(18.1)	72	(15.9)
N 25-34,999.99	26	(11.3)	35	(15.8)	61	(13.5)
N 15-24,999.99	27	(11.7)	17	(7.7)	44	(9.7)
N 5-14,999.99	15	(6.5)	8	(3.6)	23	(5.1)
Total	231	(100.0)	221	(100.0)	452	(100.0)

Table 5: Income status and School teachers' households

Income (N)	Schools				Total	N(%)
	Primary	N (%)	Secondary	N (%)		
≥ N55,000.00	48	(29.8%)	139	(47.8%)	187	(41.4%)
N 45 -54,999.99	18	(11.2%)	47	(16.2%)	65	(14.4%)
N 35-44,999.99	41	(25.5%)	31	(10.7%)	72	(15.9%)
N 25-34,999.99	23	(14.3%)	38	(13.1%)	61	(13.5%)
N 15-24,999.99	22	(13.7%)	22	(7.6%)	44	(9.7%)
N 5-14,999.99	9	(5.6%)	14	(4.8%)	23	(5.1%)
Total	161	(100.0%)	291	(100.0%)	452	(100.0%)

Table 6: Educational Status of the household heads

Educational Status	State of Residence				Total	N (%)
	Lagos	N (%)	Ibadan	N (%)		
Informal	13	(5.3)	24	(10.4)	37	(7.8)
Post Secondary	201	(81.7)	173	(74.9)	374	(78.4)
Secondary School (Completed)	17	(6.9)	30	(13.0)	47	(9.9)
Secondary School (Not completed)	6	(2.4)	3	(1.3)	9	(1.9)
Primary School (Completed)	3	(1.2)	1	(0.4)	4	(0.8)
No Education	6	(2.4)	0	(0.0)	6	(1.3)
Total	246	(100.0)	231	(100.0)	477	(100.0)

to be eligible, it must be teacher-headed or the purchase and preparation of food is by a teacher. The respondent therefore is either the head of the household or the spouse; who is in charge of purchase, preparation of meals and in charge of dispensing the food budget for the household. A minimum sample size of 246 was derived using a statistical sample size formula:

$[(z\text{-}w)^2 / d^2]$ p x q

(z-w) = 1.96, p = 80%, q =20%, d = 5% Number chosen = 500; only 482 questionaire were available for analysis.

Measurements: The 18-Question Survey module formed the core of the instrument; a portion for socio-economic status was appended. The respondents were interviewed individually.

Data analysis: The 18-Question HHFSS Module was used to collect data. The responses for each household were used to classify each household into one of the following food security categories: (a) "Food secure" (b) "Food insecure without hunger" (c) "Food insecure with moderate hunger" and (d) "Food insecure with severe hunger". Frequencies mean and standard deviation were determined using the statistical package for the social sciences (SPSS) Version 10.0.

Results

The reliability analysis of the (HFSS 18-Question Questionnaire) scale used in the study has a Cronbach's Alpha value of 0.887.

Household distribution pattern: Of the total 482 households surveyed, 51.9% (250) were in Lagos, while the remaining 48.1% (232) were in Ibadan. The distribution pattern of the households is presented in Table 1.

Household characteristics: The mean (SD) household

Table 7: Food Security Status and Residence

	Residence				Total	(%)
	Lagos	N%	Ibadan	N%		
Food secure	70	28.0	55	23.7	125	(25.9)
Food insecure/No hunger	93	37.2	106	45.7	199	(41.3)
Food insecure/Moderate hunger	57	22.8	60	25.9	117	(24.3)
Food insecure/Severe hunger	30	12.0	11	4.7	41	(8.5)
Total	250	100.0	232	100.0	482	(100.0)

Table 8: Household food security status

	School teachers				Total	(%)
	Primary	N%	Secondary	N%		
Food secure	39	22.5	86	27.8	125	(25.9)
Food insecure/No hunger	63	36.4	136	44.0	199	(41.3)
Food insecure/Moderate hunger	56	32.4	61	19.7	117	(24.3)
Food insecure/Severe hunger	15	8.7	26	8.4	41	(8.5)
Total	173	100.0	309	100.0	482	(100.0)

Table 9: Food security status and Household size

	Household size						Total	(%)
	≤5members	N %	6-10 members	N%	11-16 members	N%		
FS	80	22.5	42	27.8	3	33.3	125	(25.9)
FINH	123	36.4	74	44.0	2	22.2	199	(41.3)
FIMH	71	32.4	43	19.7	3	33.3	117	(24.3)
FISH	19	8.7	21	8.4	1	11.1	41	(8.5)
Total	293	100.0	180	100.0	9	100.0	482	(100.0)

(FS = Food Secure, FINH = Food Insecure/No hunger, FIMH = Food Insecure/Moderate hunger, FISH = Food Insecure/Severe hunger)

size was 5.31 (± 2.1) (Table 2). The mean household size in the two cities was not significantly different from each other. Of the 482 households surveyed, majority (60.8%) had households of 1-5 members. Although, civil servants accounted for most (65.8%) of 482 household heads surveyed, the occupation pattern of the household heads in the two cities was significantly different (Table 3). The income status of the household heads was also significantly different in both cities. However, the household heads with income level of ≥ 55,000 Naira were more in proportion in both cities (Table 4). The educational status of the household heads was also significantly different in both Lagos and Ibadan, as expected majority (81.7% and 74.9%, respectively) of them had post secondary education (Table 6).

Household food security status: The description of the food security status of the households is shown on Tables 7-8. Out of the 482 households surveyed, about one-fourth (25.9%) were "food secure", while the highest percentage (41.3%) was "food insecure without hunger". The food security status of the households in these two cities was significantly different. In both Lagos and Ibadan, majority of the households were food insecure without hunger, the percentage of households that were food secure in Lagos (28.0%) was higher than the percentage of households that were food secure in Ibadan (23.7%), and this difference was significant ($p<0.05$).

Discussion

The two cities in which the study was conducted are located in the South-west of Nigeria. The region is the most urbanized region and the states in which the cities are located are the most urbanized states in the Nigeria. This study clearly shows that about three-quarter of the households in the cities, of Lagos and Ibadan were food insecure and another 30.6% being food insecure with hunger.

The extent of food insecurity among these households was high when compared to the findings of Furness *et al*. (2004), Holben *et al*. (2004), Quandt *et al*. (2004), Stuff *et al*. (2004), and Tingay *et al*. (2003) in other parts of the world. However, higher prevalence (82%) of household food insecurity has been reported elsewhere (Zalilah and Tham, 2002)

The high prevalence of food insecurity observed among these households is predictive of inadequate dietary

Table 10: Food Security Status and Education level of the Household heads

Family category	Food Security Status							
	FS		FINH		FIMH		FISH	
	N	%	N	%	N	%	N	%
No education	1	16.7	2	33.3	2	33.3	1	16.7
Primary school (completed)	1	25.0	0	0.0	3	75.0	0	0.0
Secondary school (not completed)	1	11.1	2	22.2	5	55.6	1	11.1
Secondary school (completed)	3	6.4	14	29.8	26	55.3	4	8.5
Post secondary	107	28.6	165	44.1	71	19.0	31	8.3
Informal	11	29.7	14	37.8	8	21.6	4	10.8
Total	124	26.0	197	41.3	115	24.1	41	8.6

Table 11: Food Security Status and Income

Income	Food Security Status							
	FS		FINH		FIMH		FISH	
	N	%	N	%	N	%	N	%
≥ N55,000.00	73	39.0	84	44.9	19	10.2	11	5.9
N 45 -54,999.99	18	27.7	33	50.8	10	15.4	4	6.2
N 35-44,999.99	13	18.1	30	41.7	26	36.1	3	4.2
N 25-34,999.99	4	6.6	23	37.7	28	45.9	6	9.8
N 15-24,999.99	2	4.5	13	29.5	18	40.9	11	25.0
N 5-14,999.99	2	8.7	8	34.8	9	39.1	4	17.4
Total	112	24.8	191	42.3	110	24.3	39	8.6

intake, which may result in or worsen malnutrition. The income status of the households in this study shows that less than half of the households had income of ≥ N55, 000 per annum (i.e. ≥N 150/day), and going by the World Bank's definition of poverty and the current exchange rate of N135/$US1, more than half of the households were living below the poverty level. These incomes cannot be verified, however the minimum wage of N7, 500 monthly translates into N250/day respectively. Furness *et al.* (2004) and Tingay *et al.* (2003) had stated that the prevalence of food insecurity is inversely associated with household income, this is true in this study. The educational status of the household head was also observed to play a significant role in the food security status of the household this may be explained by the influence of education on income.

As observed in the study, the households of secondary school teachers were more food secure than those of teachers who were teaching in primary schools. The reason for this is clear, the former receive higher pay than the latter. The housing and living conditions and access to basic social facilities such as water supply and good toilet were found to have a significant association with food security status of the households. This is explained by the same influence of income. Contrary to the report of the national survey on housing conditions and facilities conducted in 1994/95(Federal Office of Statistics, 1996) which indicated that only 24.2 per cent of households had access to pipe borne water, 9.6 per cent to borehole water, 27.3 per cent to well water and 38.9 per cent to stream, majority (42.7%) of these households had access to borehole water, some (29.7%) to well water and the other (26.3%) to pipe borne water. This is an improvement on basic social services with time.

It was observed that more households in Lagos were food secure than households in Ibadan. The reason for this could be attributed to the nature and the economic situation in both cities; Lagos is a commercial center.

The results of this study highlight some of the factors that appeared to differentiate between the food secure and food insecure households. The factors include the educational and income status of the household heads.

Conclusion: This study has measured the household food security status in Lagos and Ibadan and has again found a high prevalence of over 70% to be "food insecure". Issues affecting household food security must be revisited since it is one of the underlying causes of malnutrition. A national survey of the extent and degree of food insecurity using the instrument employed in this survey is recommended.

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