

# Food Insecurity in Metropolis of the Developing World - observations from Central District of Karachi, Pakistan

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## Abstract

**Objective:** To assess the prevalence of household food insecurity at various income levels in urban areas of Karachi

**Methods:** A cross sectional survey of different localities in the central district of Karachi was carried out. The data was collected through household interviews of housewives conducted by trained nutritionist. Housewives were interviewed about food security status of the household.

**Results:** A total of 797 families were visited from the central district of Karachi. Mean Food Security Score increased with income level. The difference was statistically significant (ANOVA) between 1st and second ( $P=0.000$ ) and 2nd and 3rd group ( $P=0.000$ ) but not between 3rd and fourth group. At the very low and low income levels 83% & 51% families respectively were food insecure in any degree, while this percentage was very low at the middle (6.3%) and high income level (1.8%). The difference in prevalence of food insecurity between the VLI and LI, and, LI and MI income groups was statistically significant (chi.sq. test,  $p<0.001$  in each case). Hunger (because of lack of money) was experienced in the preceding year only by "very low income" (37%) and "low income" families (17%). Use of coping strategies was most frequently mentioned for parents and then for children and only occasionally for infants or grand parents. Females were more likely to be effected by food insecurity than males. Meat, milk and fruits were the food groups which were preferred and considered healthy but were avoided because of lack of money by a majority (51%-86%) of families.

**Conclusions:** In spite of having an impression of being an affluent city of Pakistan, the prevalence of food insecurity with and without hunger is rampant not only among very low income (slum dwellers) but also among low income families of Karachi (JPMA 53:556;2003).

## Introduction

Food security includes at a minimum, "the ready availability of nutritionally adequate and safe foods, and an assured ability to acquire acceptable foods in socially acceptable ways". Food insecurity is "Limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways". Hunger is "The uneasy or painful sensation caused by a lack of food. The recurrent and involuntary lack of access to food. may produce malnutrition over time".<sup>1</sup> Food insecurity, the least severe condition, consists mainly of anxiety about having enough food to eat or running out of food and having no money to purchase more. Adults who believe they are food insecure may try to avoid hunger by cutting the size of meals, skipping meals, or even going without food for one or more days. However, when food is extremely limited, these means to avoid hunger are ineffective and cause severe personal hunger and hunger that spreads to the family and children.<sup>2,3</sup>

In developing countries, growth in urban poverty, food insecurity, and malnutrition and a shift in their concentration from rural to urban areas will accompany urbanization.<sup>4</sup> Haddad et al used survey data on poverty (from 8 countries) and on child under nutrition (from 14 countries) to address this question.<sup>5</sup> Using data from the past 15-20 years, they found that in a majority of countries

the absolute number of poor and undernourished individuals living in urban areas has increased, as has the share of poverty and undernourishment coming from urban areas. There is surprisingly little research on urban poverty, food insecurity and malnutrition. Intra-urban differences are not sufficiently highlighted. Too often, all urban households-rich and poor-are averaged out to provide one single estimate of poverty or malnutrition. In countries with high income and social inequalities this can be particularly misleading. These trends indicate need for more research on these issues.

Development and use of appropriate methods is essential for monitoring of food security. Type of indicators used for assessing food insecurity could be categorized as "process indicators" - those that describe food supply and food access-and "outcome indicators" that describe food consumption.<sup>6</sup> Process indicators are insufficient to characterize food security outcomes. Chung et al<sup>7</sup> found that there was little correlation between a very large set of process indicators and measures of food security outcomes. Correlation between area-level food production and household food security was also observed to be low.<sup>8</sup> The four simple ways of measuring household food security outcomes are individual intakes, household caloric acquisition, dietary diversity, and indices of household coping strategies.<sup>9</sup> Use of such qualitative measures has

proved to be successful in USA, and could also be adapted for rapid and valid assessment household food insecurity in developing countries.<sup>10-12</sup>

In Pakistan some assessment of household food security has been done of rural households but very little information is available on food security status of urban households. No assessment of food insecurity had been done yet on the basis of qualitative measures. Since the 1960s the UN has been working in Pakistan towards improved food security and FAO identifies the lack of data availability (in quantity and quality) as a serious problem. It has been acknowledged that in Pakistan "there is little direct data on coping mechanisms. This is an area where primary data might have to be collected". Need for assessment of urban food insecurity has also been highlighted in FAO country strategy plan.<sup>13</sup>

This project was planned to measuring household food insecurity outcomes in one of the most urbanized city of Pakistan - Karachi, on the basis of a few qualitative measures.

## Methodology

### Sampling

Data was selected from central district of Karachi. Cluster sampling was done to get a proportionate sample of households of various income levels in the district. House size was used as proxy measure for identifying income level. Families residing in houses built on less than 80 square yards, 80 to 119 square yards, 120 to 399 and 400 or more square yards were classed as very low (VLI), low (LI), middle (MI), and high income (HI) respectively. A total of 20 clusters four from each subdivision were to be selected and from each cluster 50 houses were to be surveyed. The aim was to have representation of various sized houses from each division if possible. But in order to have comparable number of various sized houses in the total sample the number of clusters and houses was modified and from those subdivisions where there was a variety of houses four, otherwise three clusters were identified. Thus a total of 18 clusters were surveyed.

### Research Tools

For data collection, questionnaire was used as the research tool. It included four portions that are as follows,

- a) Demographics: age, sex, education, occupation, and income of family members, and possession of housing facilities and household assets and cultural origin of the family.
- b) Food security: experience of hunger, or not having enough food in previous 12 months; and coping strategies used by dealing with food insecurity by family. The USA

'core module'<sup>10</sup> and short form food security questionnaire was used as guide for formulating questions to assess food security with or without hunger.<sup>14</sup>

c) Illnesses, presence of or death from any chronic illness or experience of any acute illness in the previous week by any family member.

d) Food consumption: quantitative information about food cooked in household in previous 24 hours and qualitative information about food consumed by various family members on the previous day.

Pre-testing was done on 150 families. After testing the questionnaire, necessary changes were made, some questions were rephrased and some were omitted.

### Data Collection Procedure

The data collection was started from 13th February 2001 and lasted till 23rd April 2001. It took about 3 months to complete the data collection. During the period of these 3 months, a break of 2 weeks on the occasion of Eid-ul-Azha and a second break of 10 days for Moharram were taken. Four days a week were assigned for surveys i.e., Mondays, Tuesdays, Thursdays and Saturdays, respectively. The timings of the survey were from 11:00am - 4:30pm.

### Data Entry and Analysis

Data was entered in Microsoft Excel and then was transferred to SPSS programme. The SPSS programme was used for the statistical analysis of the data and providing information about the results of the data as required.

## Results

### Socio demographic Characteristics of the Respondents

A total of 797 families were visited from the five subdivisions of the central district of Karachi, namely: North-Nazimabad, Nazimabad, Federal B. area, North Karachi and Liaqatabad (Table 1). As the various subdivisions differed in the variety of proportion of plots the sample did not have similar number of houses of each category from each subdivisions.

Socio demographic characteristics of the families are presented in Tables 2a and 2b. The four groups were different from each other in terms of cultural and geographic origin, financial status, parents' occupation, their educational status, geographic origin of families (the place from where forefathers belonged) and family size to varying degrees.

The very low income group differed markedly from the other three income groups in terms of place of birth of fathers, mother tongue and had a higher proportion of migrants from rural areas.

**Table 1. Number and percentage of households of various income levels surveyed from various subdivisions of district central Karachi.**

House size category	Subdivision District Central											
	Liaqatabad		Nazimabad		North Nazimabad		Gulberg		New Karachi		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
D (Very Low)	7	6	71	33	29	22	27	20	21	10	155	19
C (Low)	100	91	42	19	0	0	5	4	83	41	230	29
B (Middle)	3	3	38	17	49	37	53	40	49	24	192	24
A (High)	0	0	67	31	54	41	49	37	50	25	220	28
Total	110	100	218	100	132	100	134	100	203	100	797	100

**Table 2a. Sociodemographic characteristics of head of households from various income groups.**

		House size category			
		VLI	LI	MI	HI
		%	%	%	%
Birth place of father (country)	Pakistan	94	87	88	86
	India	5	13	12	12
	Other	1	0	0	2
Birth place of father (city/village)	Karachi	58	79	88	82
	Hyderabad	2	1	2	2
	Lahore	9	3	4	4
	Islamabad	1	1	0	1
	Peshawer	1	2	0	1
	Quetta	0	0	1	0
	other city	9	11	5	7
	village	20	4	1	3
Mother tongue of father	Urdu	58	80	90	79
	English	0	1	0	0
	Punjabi	30	11	5	11
	Sindhi	3	2	1	2
	Pushto	7	6	1	2
	Balochi	1	0	0	0
	Memon/Gujrati	1	1	3	4

VLI = Very low income

MI = Middle income

LI = Low income

HI = High income

Reported income and social economic status (SES) score increased with SES. In relation to SES score all the four groups were significantly different from each other. However, in terms of reported income the two lowest

income groups were significantly different from the two highest income groups (ANOVA,  $P < 0.05$  in each case). In terms of age and education of parents the VLI and LI were significantly different from MI and HI group. The latter two

**Table 2b. Socio demographic characteristics of head of households: age, education, income and family size.**

		House size category			
		VLI	LI	MI	HI
Age of father (years)	Mean	40.4	43.3	43.4	43.0
	SD	9.8	9.6	10.3	8.9
Age of mother (years)	Mean	35.0	37.3	37.4	37.7
	SD	9.1	9.5	9.1	9.1
Education of father (years of formal education)	Mean	4.4	8.5	13.5	13.5
	SD	4.9	4.9	3.0	3.3
Education of mother (years of formal education)	Mean	3.3	7.0	12.2	12.6
	SD	4.4	4.7	3.3	3.1
Family size	Mean	6.6	6.3	5.4	5.7
	SD	2.4	2.4	1.8	2.0
Monthly income (Pak Rupees)	Mean	3623.0	5453.0	15698.1	26346.0
	SD	1817.5	3811.9	10864.6	13070.6
Monthly income per person (Pak Rupees)	Mean	627.2	996.5	3044.8	4408.9
	SD	410.2	770.0	2594.7	2590.5
Social economic status score	mean	4.1	8.2	14.7	19.0
	SD	3.7	6.1	10.3	9.1

were not significantly different from each other. Regarding education of father and mother the lower three groups were significantly different from each other and the third group was similar to the fourth group. Thus the four income groups had different socio economic characteristics: the lowest being low income least educated, maintaining lowest standard of living; the 2nd group had very low income but was more educated and had slightly higher standard of living; the 3rd was more educated and affluent than the 1st and 2nd and less affluent but not less educated than the fourth group. The family size was significantly different between the first two and last two income groups.

The purpose of this survey was to study inter group differences in three distinct socio economic groups and not the effect of any specific sociodemographic factor. Therefore the above mentioned differences in the demographic characteristics of the three groups are not considered to be confounding factors.

### Food security status of families

#### Food security score

A ten item food security scale was developed for this study was used to generate food security score (FSS) and to categorise families on the basis of food insecurity and hunger. Responses to questions were given a score of 0,2,4,6 or 10 (table 3). For each item a maximum score of

ten and a grand total of 100 indicating maximum food security was possible.

Mean FSS increased with income level (VLI: 64.8±22; LI: 79.4±16; MI: 92.5±6; HI: 93.6 ±5). The difference was statistically significant (ANOVA) between 1st and second (P=0.000) and 2nd and 3rd group (P=0.000) but not between 3rd and fourth group.

#### Prevalence of food insecurity and hunger

Families were also categorized as food secure, food insecure without hunger and food secure with mild or severe hunger on the basis of responses to items on food security scale. Item 1 to 7 indicated food insecurity. Families who scored less than four on any two of these items were labeled food insecure. Item 8 and 9 indicated likelihood of moderate hunger and families scoring less than 4 on any one or both of these items were categorized as having mild hunger. Item 10 indicated severe hunger and families scoring less than four on this item were termed as having severe hunger.

Proportion of families who had experienced food insecurity or hunger in the previous year is given in Figure 1. The proportion of families who had experienced food insecurity in the preceding year decreased sharply from the lowest to middle income level and then almost came to a plateau, and the high income group was not very different from the middle income group. At the very low and low

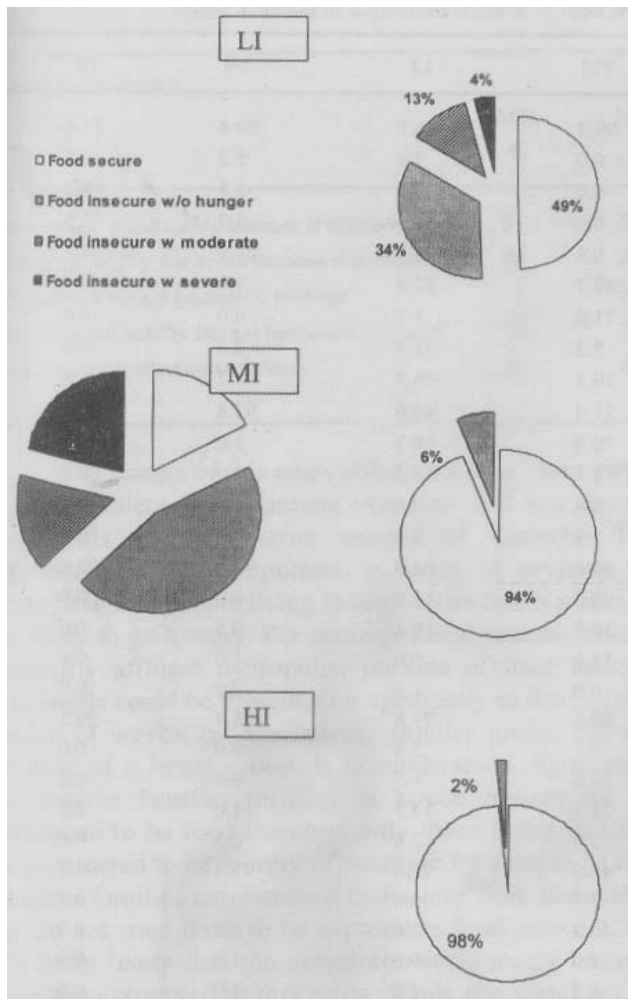


Figure 1. Prevalence of food insecurity and hunger at various income levels.

income levels 83% and 51% families respectively were food insecure in any degree, while this percentage was very low at the middle (6.3%) and high income level (1.8%). The difference in prevalence of food insecurity between the VLI and LI, and, LI and MI income groups was statistically significant (chi.sq. test,  $p < 0.001$  in each case). Hunger was experienced only at two lowest income levels. At VLI level 37.25 and at low income level 16.5% families had experienced any degree of hunger in the preceding year.

#### Coping strategies used by various family members

In order to assess the relative impact of food security status on food intake of various family members the housewives were asked about the frequency with which particular coping strategies were used for various family members.

Coping strategies were only occasionally used for infants or grand parents Use of coping strategies was most frequently mentioned for parents and then for children (Figure 2). Among both the generations, females were more

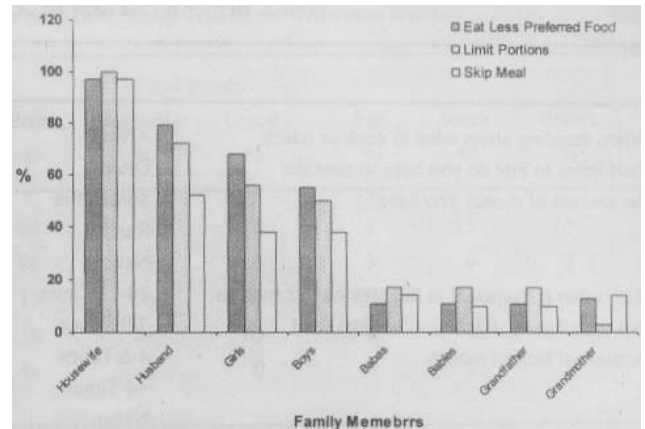


Figure 2. Coping strategies used by various family members among food insecure families.

likely to be effected than males.

#### Effect of food security on food choices

In order to assess the impact of food insecurity on selection of food items the families were asked four questions about adjusting food selection. They were requested to mention which particular food items that they otherwise preferred or considered healthy were avoided which food items they consumed just because it was cheap and what were the foods in which they selected relatively unhealthy items because of lack of money. It was also asked that if they had to limit portion size for which food it was done most often and if any meal was skipped which one was missed out.

As all the food insecure families did not provide detailed information about food selection, only families who mentioned any adjustment in food selection were included in this analysis. These were only from the two lowest income groups. These families preferred to avoid expensive food most often (83.5%). This was followed by avoiding expensive healthy food (77.2%), and eating cheap food (74.7%). Eating unhealthy but less expensive food was stated less frequently (32.9%).

Details of types of adjustments made in food selection from particular food groups by food insecure families are given in table 4. Meat, milk and fruits were the food groups which were preferred and considered healthy but were avoided by a majority (51%-86%) of families and portion sizes were limited because of lack of money. Foods from vegetable and cereal groups though not liked or considered healthy, were consumed by a large proportion of families because they were cheap (61%-76%).

#### Discussion

In an earlier study, presence of malnutrition at various income levels has been observed.<sup>1</sup> At low middle and high income level, 51%, 42%, 38% of households respectively had at least one underweight child in the family.

**Table 3. Responses (%) to items of food security scale at various income levels.**

		VLI	LI	MI	HI
When deciding about what to cook or which food items to buy do you have to consider the amount of money you have?	Always	99.4	86.1	59.4	51.4
	Often	0.0	3.0	5.2	7.3
	Sometimes	0.0	2.2	6.8	8.3
	Rarely	0.0	0.0	5.7	5.5
	Never	0.6	8.7	22.9	27.5
How often it happened in the previous 12 months that your family didn't have enough food because of lack of money	10-12 Times	49.7	17.8	1.0	0.9
	7-9 Times	11.6	5.2	0.0	0.0
	4-6 Times	5.2	11.7	0.5	0.0
	<4 Times	16.1	15.7	4.7	1.8
	Never	17.4	49.6	93.8	97.3
How often you rely on less preferred and less expensive foods because of lack of money.	Every Day	40.0	18.7	1.6	0.5
	Few Days/Week	1.3	6.5	0.0	0.5
	Few Days/Month	8.4	9.6	1.0	0.5
	Few Days/Year	1.9	0.4	0.0	0.0
	Never	48.4	64.8	97.4	98.6
How often you borrow food or money to buy food because of lack of money	Every Day	9.0	3.9	0.0	0.0
	Few Days/Week	16.8	6.1	0.5	0.0
	Few Days/Month	13.5	9.6	1.0	0.9
	Few Days/Year	0.0	2.6	0.0	0.0
	Never	60.6	77.8	98.4	99.1
How often you purchase food on credit because of lack of money	Every Day	9.7	3.9	0.0	0.0
	Few Days/Week	20.0	6.5	0.0	0.0
	Few Days/Month	21.3	14.3	1.0	2.3
	Few Days/Year	0.0	2.6	0.5	0.0
	Never	49.0	72.6	98.4	97.7
How often you rely on help from relatives or friends because of lack of money.	Every Day	7.7	0.4	0.0	0.0
	Few Days/Week	10.3	2.6	0.0	0.0
	Few Days/Month	12.9	9.6	1.0	0.9
	Few Days/Year	1.3	2.2	1.0	0.0
	Never	67.7	85.2	97.9	99.1
How often you ration money to household members because of lack of money	Every Day	3.2	0.9	0.0	0.0
	Few Days/Week	1.3	0.9	0.0	0.0
	Few Days/Month	1.3	0.4	0.0	0.0
	Few Days/Year	0.6	0.0	0.0	0.0
	Never	93.5	97.8	100.0	100.0
How often you limit portions at meal times because of lack of money	Every Day	12.3	3.0	0.0	0.0
	Few Days/Week	3.2	1.3	0.0	0.0
	Few Days/Month	3.2	2.2	0.0	0.5
	Few Days/Year	0.0	1.7	0.0	0.0
	Never	81.3	91.7	100.0	99.5
How often you reduce no. of meals eaten in a day because of lack of money.	Every Day	7.7	2.2	0.0	0.0
	Few Days/Week	11.6	4.3	0.0	0.0
	Few Days/Month	6.5	3.5	0.0	0.5
	Few Days/Year	1.3	3.0	0.0	0.0
	Never	72.9	87.0	100.0	99.5
How often you skip whole days without eating because of lack of money.	Few Days/Week	9.7	0.4	0.0	0.0
	Few Days/Month	7.7	2.2	0.0	0.0
	Few Days/Year	1.9	0.9	0.0	0.0
	Never	88.7	96.1	100.0	100.0

**Table 4. Types of adjustments made in food selection from particular food groups by food insecure families.**

Types of adjustments	Food groups								
	Milk	Meat	Fruit	Vegetables	Cereal	Fat	Snack	Sweet	
	%	%	%	%	%	%	%	%	
Preferred but avoid eating because it is expensive	51	70	68	6	3	5	15	13	
Considered healthy but avoid because it is expensive	58	60	86	5	0	3	6	3	
Not preferred but eat because it is cheap	3	10	15	76	66	5	3	0	
Not considered healthy but eat because it is cheap	0	10	6	61	65	0	0	0	
Limit Portions for Particular foods	12	88	44	5	0	0	2	0	

The results of this study show that food insecurity is highly prevalent (81%) among very low and low income households of the district central of Karachi. This observation is very important in terms of revising the assumption that people living in large cities like Karachi are not likely to go hungry. For socio-political reasons even in apparently affluent metropolis, pockets of food insecure households could be present. But apparently in the realm of display of wealth by a relatively smaller group, the real situation of a larger group, is misunderstood. Particularly low income families residing in 'pucca' houses are not considered to be food insecure, only those living in slums are considered to be worthy of attention by various NGO's. As these families are standard conscious, they themselves also do not want them to be exposed as food insecure, and it is quite likely that the actual condition might be more grave than observed in this study. While the social leaders advise the public to educate their children, they must not forget that a large proportion could do this only by cutting back at food cost even to the extent of going hungry. Indirect measures like provision of quality education and health care could also lead to improved food security of families of white collar workers.

The high prevalence rates of hunger and food insecurity are detrimental not only to the welfare of the families and persons concerned but they also pose a threat to social and political environment of the locality. Under nutrition effects behavior.<sup>15</sup> Children who experience hunger because of low income are more likely to have behavioral and emotional problems than low-income children who have enough to eat. Thus, measures to control food insecurity and hunger in Karachi could also assist in controlling political unrest.

It is generally assumed that rural households are more food insecure but the observations made in this study show that the lower income urban households in Pakistan are probably much more at risk of food insecurity than average rural households. Alderman et al<sup>16</sup> studied a

representative sample of rural households from all the provinces of Pakistan and on the basis of per capita calorie availability, concluded that on average rural families were food secure throughout the year. Though the methods used to assess food insecurity in the present study and the one by Alderman et al are different but still high prevalence of hunger shows that urban poor are probably more food insecure than the average rural population. Studies are needed to assess food security in rural and urban areas using similar methodologies. In an article about solutions to Pakistan's economic problems J.K. Robert, United Nations Resident Coordinator mentioned, "Although poverty has tended to be characterised as being rural in nature, the incidence of urban poverty is of increasing importance, as the urban population steadily increases. This must be addressed with specific policies and programmes. There is a need to ensure a general level of household food security and nutrition commensurate with standards applicable in other middle income countries. To end this, inequalities in resource and income distribution must be addressed".<sup>17</sup>

In terms of impact of food insecurity on particular persons, the observation that females and particularly mothers were more vulnerable was not unexpected. This has been reported in several other studies also<sup>18</sup> and should be taken seriously for the sake of women themselves and for the society as a whole. Women have been identified as key to food security.<sup>19,20</sup>

Food insecure people are likely to have poorer diets in terms of quality also. Decrease intake of fruit, meat and milk with decreased food security has been observed elsewhere also.<sup>21,22</sup> Monotony of diet leads to decrease in micro nutrient density of diet and is the cause of lowered human potential of the population.

### Conclusion

Food insecurity and hunger are not non-existent but rather highly prevalent at lower income levels in Karachi. For the welfare of the households and peace and prosperity

of urban areas of the developing world, immediate and effective measures should be taken to decrease the rates of hunger and food insecurity.

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