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# **Nutritional Surveillance**

**for Disaster Preparedness and Prevention of Nutritional Blindness**

**Handbook 1992**

**Helen Keller International**

**HKI**

***Helen Keller International  
Dhaka, Bangladesh***

# **Nutritional Surveillance Project**

## ***Objectives and Methodology***

**1992  
Heien Keller International  
Dhaka, Bangladesh**

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**Aga Khan Community Health Project (AKCHP)**

**Bangladesh Rural Advancement Committee (BRAC)**

**Bangladesh Red Crescent Society (BDRCS)**

**Cooperative of American Relief Everywhere (CARE Bangladesh)**

**CONCERN**

**Gono Unnayan Prochesta (GUP)**

**Helen Keller International, Bangladesh (HKI)**

**Institute of Public Health Nutrition (IPHN)**

**International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B)**

**Rangpur Dinajpur Rural Service (RDRS)**

**United Nations Children's Fund (UNICEF)**

**United States of America Agency for International Development (USAID)**

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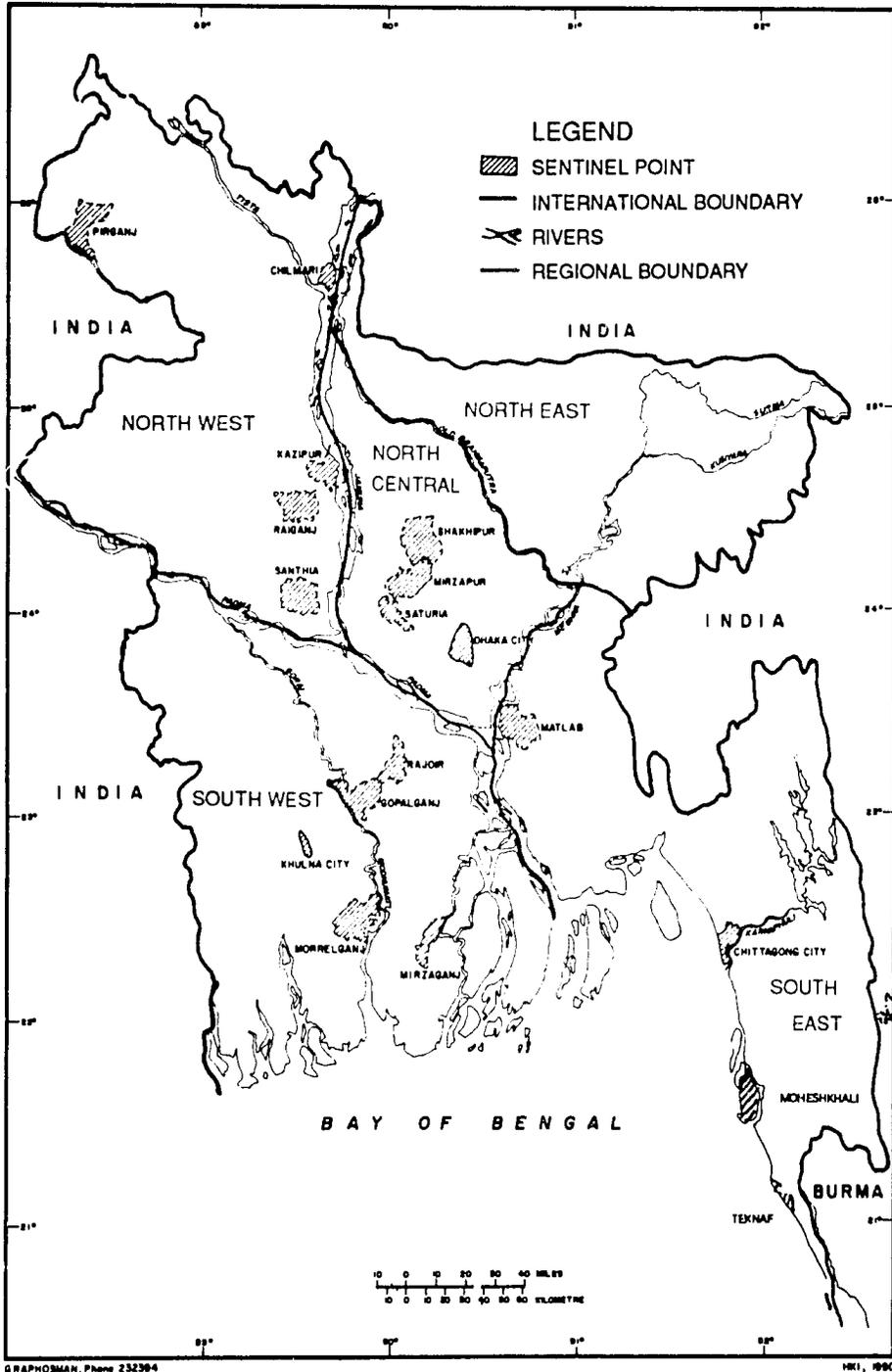
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Figure 1

Map of Bangladesh Showing Nutritional Surveillance Project Regions and Sentinel Points



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## Introduction

Bangladesh has a history of recurrent natural disasters which cause extensive distress to a population that is always living close to the survival line. Recent disasters include the floods of 1987 and 1988 which caused widespread damage to much of the country. In 1991 there was a devastating cyclone in the coastal areas which resulted in a massive loss of life and property.

The effect of such disasters is especially damaging in Bangladesh due to the generally poor health status of people even in normal times. Morbidity and mortality, especially among young children and mothers, are extremely high (1-3). The situation worsens following a natural calamity due to exposure to contaminated water, crowding and poor sanitation, and above all, through decreased access to food due to crop and employment losses (4-5).

As resources are limited, it is important that relief programs are effective in the event of a natural disaster. It is important to identify which areas are under most stress even before a calamity, to help prioritize those areas most likely to need relief assistance should a disaster occur. Following implementation of assistance, it is also important to know if relief and rehabilitation work is effective and efficient in relieving distress.

In developing countries the nutritional status of young children is a very sensitive indicator of sudden changes in food supply and general nutritional and health conditions of a population. It is also a forerunner of changes in child mortality (6). The monitoring of children's nutritional status in disaster-prone communities is thus a vital tool to assess, plan and coordinate the response to ongoing and unforeseen crises related to floods and other natural disasters (7-8). The collection of timely and reliable nutrition data and other early-warning information signalling increasing distress is a means of improving the effectiveness of relief programs.

To provide this information, the Nutritional Surveillance for Disaster Preparedness and Prevention of Nutritional Blindness was started in October, 1989 with a view to establishing an ongoing surveillance system. The project was initiated by Helen Keller International in collaboration with a number of non government organizations (NGOs), the Institute of Public Health and Nutrition (IPHN) and UNICEF. The project is financially supported by USAID and coordinated by Helen Keller International (HKI). Ten organizations are now involved in data collection from four regions covering most of Bangladesh, except the North Eastern part of the country (see table 1:figure 1).

## Objectives

The overall goal of the project is to minimize the incidence of nutritional blindness, protein-energy malnutrition, morbidity and mortality among Bangladeshi children through the production, analysis and use of child health and nutrition data in disaster preparedness and relief. Four specific objectives are of special importance for this project:

- o To establish baseline health and nutrition indicators and identify seasonal trends among children under 5 in disaster-prone areas. This will enable the identification of young children most vulnerable to the effects of disasters, and give a base against which the effects of interventions can be assessed;*
- o To identify high-risk under 5 populations and geographic pockets of undernutrition before, during and after recurrent disasters, and identify shifting patterns of risk, in order to facilitate the relief response by adjusting policies and prompt intervention by the Government of Bangladesh (GOB)/donors/NGOs;*
- o To provide an on-going data base, which can be used in the evaluation of the effectiveness and efficiency of disaster programs;*
- o To develop standardized methods, criteria, policies, and procedures for child health and nutrition monitoring in Bangladesh.*

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## Methodology

### Selection of disaster-prone areas and slums

In the rural regions data is collected from disaster prone sentinel points which correspond geographically to Upazilas<sup>1</sup>. These are shown in figure 1. Disaster-prone sentinel points were selected according to the frequency and severity of certain distress indicators, including liability to famine, susceptibility to natural disasters, agricultural production and employment opportunities. The availability of a NGO able to participate in the Nutritional Surveillance Program in a given Upazila was also a consideration.

In Dhaka, Chittagong and Khulna, slums were selected from sites where NGOs were already running development programs and were able to collect data for the Nutritional Surveillance Program. Most organizations involved in data collection are responsible for two sentinel points or slums.

At the beginning of the project results were presented for each Upazila, but subsequently Upazilas were grouped into areas. To remain consistent with other organisations involved in disaster control, the areas have been redefined from the beginning of 1992 to be the same as the regions in the Flood Action Plan (43). These comprise the North West Region, the North Central Region, the South West Region and the South East Region. These are shown in figure 1. There are no sentinel points in the NSP in the North East Region at this stage.

The North West Region is represented by five sentinel points, namely Pirganj, Chilmari, Kazipur, Raiganj and Santhia. The region is bounded by the Jamuna in the east and the Ganges to the south. Annual rainfall ranges from 1,250 mm in the west to more than 2,200 mm in the north and northeast. Seasonal flooding is mainly intermittent or shallow, but a substantial area in the southeast is prone to deep flooding. Large

areas are double cropped with the help of tube-well irrigation which has spread rapidly in the past decade, but the drier western areas and low-lying areas in the southeast are mainly single cropped. Population density averages 7/ha.

The North Central Region is represented by the three rural sentinel points of Shakipur, Mirzapur and Sauria, and also contains Dhaka city. It is bounded by the Jamuna river in the west, the Old Brahmaputra channel in the north, the Lakhya and Meghna rivers in the east, and the Padma in the southwest. Annual rainfall ranges from 1,600 mm in the west to 2,200 mm in the northeast. Seasonal flooding is mainly shallow in the north, becoming deeper in the centre and south where drainage is impeded. Many flood plain areas are double or triple cropped. Population densities range from 3.5/ha in parts of the Madhupur Tract to over 12/ha in some flood plain areas.

The South West Region is represented by the sentinel points of Rajoir, Gopalganj, Morelganj and Mirzaganj and also contains Khulna city. It is bounded by the Indian border in the west, the Ganges-Padma in the north, the Lower Meghna in the east and the Bay of Bengal in the south. Population density ranges between 5/ha in the southwest to 9/ha in the north. Annual rainfall ranges from 1,500 mm in the west to 3,000 mm in the southeast. Seasonal flooding is mainly shallow in the west and on the tidal floodplain in the south, but is deep in the centre and east. There is double and triple cropping in the north and east, but single cropping in the southwest.

The South East Region is represented by the sentinel points of Matlab MCH-FP, Matlab-ex., Moheshkhali and Teknaf and contains Chittagong city. It occupies the area between the Indian and Myanmar borders in the east, the southern part of the Sylhet Basin in the north, the middle and lower Meghna channels in the west and the Bay of Bengal in the south. Annual rainfall ranges from 2,000 mm to 3,000 mm. Substantial areas in the north and centre are prone to deep

Table 1.  
Organizations collecting data from urban slums and four rural regions of Bangladesh

Region	Rural Sentinel Point	Organization
North West	Pirganj	RDRS
	Chilmari	RDRS
	Kazipur	ICDDR,B
	Raiganj	ICDDR,B
	Santia	BRAC
North Central	Saturia	BRAC
	Mirzapur	CARE
	Shakipur	CARE
South West	Morelganj	IPHN
	Mirzaganj	IPHN
	Rajoir	GUP
	Gopalganj	GUP
South East	Matlab-MCH-FP	ICDDR,B
	Matlab-extension	ICDDR,B
	Moheshkhali	BDRCS
	Teknaf	BDRCS
<b>Urban slum</b>		
Urban Slums	Dhaka Ward 60	AKCHP
	Dhaka Ward 62	AKCHP
	Khulna	CONCERN
	Chittagong	CONCERN

flooding; flooding tends to be shallow in the southeast and near the coast. Flooding is mainly by ponded rainwater, but eastern parts are affected by flash floods from the eastern hills. Population density averages 14.5/ha

The North East Region is not currently included in the NSP. It is bounded in the north and east mainly by hills bordering India, in the west by the Old Brahmaputra and Lakhya rivers, and in the south by the Meghna river and the northern boundary of the Southeast region. This is the wettest region of the country, with annual rainfall ranging from 2,200 mm in the west to over 5,000 mm in the northeast. Population density ranges from 2.5/ha in the centre to 8/ha in parts of the west and south. Seasonal flooding is mainly shallow in the east and west, with flash flooding along the foot of the hills. Central and southern

areas are subject to deep flooding. A single crop of boro paddy is grown in the lower areas and higher land is mainly double cropped.

The organizations responsible for data collection from the different regions are shown in table 1.

### Sampling Procedure

The target population of the Nutritional Surveillance Program comprises children aged 6-59 months in the sentinel points and slums, and the household is designated as the unit of sampling. Cross-sectional data is collected every two months from 6000-8000 children each round of data collection. The method of sampling in the rural areas is different from the method of sampling in the urban areas.

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**Rural regions:** by multistage random cluster sampling, 400-500 children are selected from each of the sentinel point Upazilas. First, half of the Unions are randomly selected in each Upazila. Secondly, 25 villages are randomly selected from the group of Unions and finally, one particular household in each of the selected villages is randomly selected from the Expanded Programme of Immunization (EPI) listing of children. That particular household is the starting point of the first cluster of children.

The NGO surveillance team measures every child aged 6-59 months in a given household, excluding physically disabled children. Socioeconomic and distress data are also collected from the child's household. Once the household data collection is completed, the surveillance team moves on to the next nearest household. This procedure is repeated until a maximum of 20 children have been measured. When a village has been completed, the team moves to the next randomly selected village. A total of 25 villages is surveyed in one Upazila.

**Urban slums:** for practical reasons data is only collected from NGO-program areas within each slum. One household is randomly selected from the NGO listing of households and that is the first one to be surveyed. If there are children aged 6-59 months in that household they are measured and socioeconomic and distress data is collected from the family. After collecting the data the field workers move on to the next nearest household. This procedure is repeated until the required number of children has been seen. For every round of data collection in a slum, a different household within the NGO-program area is selected as the starting point. Within a given slum, socioeconomic and health status tend to be fairly homogeneous and the sample is therefore taken to be representative.

### Data Collection

Data is collected on four aspects relevant to

disaster preparedness and the prevention of nutritional blindness: nutritional status; health status; socioeconomic status; and distress factors. The rationale for the selection of the different indicators and the methods of data collection are discussed below.

### *Nutritional status*

In Bangladesh, the assessment of the nutritional status of children 6-59 months of age is an important tool in estimating the degree of distress within a community. It is a sensitive indicator of the availability of food and is also a predictor of childhood mortality (6). Anthropometry plays a most significant role in the direct assessment of childhood nutritional status (6,9-11). Measurements are made of weight, height, and MUAC (mid upper arm circumference) and an estimate of age is made. From these measurements 4 indicators are derived: Wt/Ht, Wt/Age, Ht/Age and MUAC. These indicators reflect acute and chronic under-nutrition.

One of the major objectives of this program is to identify a set of indicators which best reflects changes in nutritional status at a low cost. Some of the advantages and disadvantages of these indicators are considered in the next section.

**Undernutrition generally:** Wt/Age is the most common index, but its use is limited as an estimate of the duration of malnutrition cannot be made (8,12). Exact age is frequently not known in Bangladesh, and this is a potential source of error.

**Acute undernutrition:** Wt/Ht is the most frequently used indicator of recent variations in nutritional status and shows wasting. It requires a precise measurement of height, and the presence of edema or tissue fluid may make weight misleadingly high. The major advantages of using Wt/Ht are that it may be considered almost race and age independent, and it specifically measures acute undernutrition (12).

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MUAC (mid upper arm circumference) is another indicator of acute undernutrition or wasting, but it measures specifically changes in body mass and not in body fluid. That is why it is found to be a slower indicator of recent changes in nutriture than Wt/Ht (13-15). Nevertheless, MUAC, without correction for age or height, is the best indicator to assess the risk of dying (16-18). Another advantage is that MUAC is a quick and easy screening method (12). A general disadvantage of MUAC is the possibility of high measurement errors (19). Both the instrument and subject costs of MUAC are low, but the training and standardization costs may be high.

Chronic undernutrition: Ht/Age is the most appropriate index to measure nutritional changes in the long term. This is an indicator of slowed skeletal growth or stunting, a process which takes time to develop or to resolve. Ht/Age has the same drawback as Wt/Age, being an age-dependent indicator.

*Method of nutritional data collection:* nude or lightly clothed children are weighed to the nearest 0.1 kg on CMS scales<sup>2</sup>, which are regularly calibrated against standard weights. Recumbent and supine lengths are measured to the nearest 0.1 cm on a locally constructed two-track length board. MUAC is measured to the nearest millimeter by using TALC numeral insertion tapes<sup>3</sup>. The date of birth is seldom accurately known, but is estimated to the nearest day for every child by carefully interviewing the mother. A standard technique has been developed using the Bengali calendar.

### *Health status*

Four health indicators of children 6-59 months old are used in the Nutritional Surveillance Project. These are point prevalence of diarrhea, point prevalence of nightblindness, point prevalence of acute respiratory infection and vitamin A capsule distribution coverage.

Point prevalence of diarrhea: diarrhea is a leading cause of mortality among preschool children in Bangladesh. There is a close relation between diarrhea and undernutrition. Diarrhea may also increase a child's risk of developing xerophthalmia (20).

Point prevalence of nightblindness: xerophthalmia, the clinical eye manifestation of a lack of vitamin A, is the leading cause of blindness in preschool children in developing countries. Recent studies have also indicated that children with vitamin A deficiency have a 4-12 times higher risk of mortality than non-deficient children (21). Other studies have shown that children with vitamin A deficiency have a higher risk of anemia, diarrhea, and respiratory diseases than non-deficient controls (22-26). Nightblindness is an early sign of vitamin A deficiency. In Bangladesh in 1982-83, the prevalence of nightblindness of children aged 6-59 months was 3.6% in the rural areas and 2.6% in the urban areas (44). This is much higher than the WHO criterion (1%) for a public health problem (27).

Point prevalence of acute respiratory infection: acute respiratory infection (ARI) is one of the major causes of death among preschool children in Bangladesh (28). Data on the prevalence of ARI has been collected since August, 1991.

Vitamin A capsule coverage: since 1973 a national programme has been in operation which distributes high potency vitamin A capsules (200,000 i.u.) to children aged 6-72 months semi-annually. There are various studies which show that vitamin A supplementation improves not only the vitamin A status, but also growth, iron status and child survival (24-26, 29,30).

*Method of health data collection:* the point prevalence of diarrhea and nightblindness and receipt of VAC in the last 2 months is obtained by a history from the mother or the adult caretaker of the child. The point prevalence of diarrhea is

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defined as three or more stools in the last 24 hours. ARI is defined as a combination of fever ( $>37^{\circ}\text{C}$ ) and a breathing rate of over 50/minute. A history of nightblindness is obtained from the mother; this has been shown to be a reliable tool for assessing the extent of the vitamin A problem (31).

### *Socioeconomic status*

Socioeconomic conditions are a marker of the level of welfare generally. In Bangladesh, many studies have shown the relationship between socioeconomic status and nutritional and health levels (4,28,34-38). The household characteristics most frequently reported in relation to nutritional and health status are education, land size and ownership, income, and occupation.

The indicators selected for the nutritional surveillance project include family size, number of children under 5, occupation of the head of the household, previous week's salary of the main earner for those who are dependent on daily wages or services, highest education level (years) of male and female household members, type, size and actual value of the main living house, and amount of agricultural and homestead land owned. Landless is defined as having no land at all.

*Method of SES data collection:* data is collected verbally from the mother, the caretaker of the child or another reliable informant, and is recorded on the collection form by the field worker.

### *Distress factors*

General indicators of distress are collected at both the area and household level. Data is collected on the occurrence of natural disasters, such as floods, cyclones, crop damage, and drought. Market prices of rice, wheat flour, lentils, potato, unrefined sugar, kerosene and soybean oil are recorded. Household level data includes the sale of household assets to fulfil basic

needs; this is a late indicator of household distress. These assets are categorized into four major groups: household items, jewellery, livestock, and land. Food loans are another indicator of distress and this information is also collected.

### *Method of distress factors data collection:*

household level data is obtained verbally from the mother or caretaker of the child and area information is recorded from field workers' observations.

### Field Worker Training

Field workers from the different NGOs are trained in techniques of anthropometry and data collection, including estimation of date of birth and techniques of interviewing and form filling. Initially workers are given training of 1-2 weeks and subsequently attend retraining sessions of 2-3 days every two months. Training sessions also cover relevant health topics such as nightblindness, diarrhea, breastfeeding, weaning and acute respiratory infections. The training sessions allow field workers to receive feed back on the results from the different regions.

A training manual has been developed in conjunction with IPHN (see NSP publications).

### Quality Control

During data collection the surveillance NGO team members work in pairs, with one NGO supervisor rotating between three field workers. HKI monitoring personnel are continuously in the field to visit the NGO teams; each monitoring unit is responsible for 2 or 3 NGO teams during each round of data collection. The HKI monitoring personnel check the equipment, supervise the data collection and anthropometric measurement and assist in case of problems. Separate HKI quality control teams visit all areas during each round of data collection to verify measurements on 5-10% of children. They arrive without warning and repeat anthropometric

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measurements and health data questionnaires on all children seen by the NGO team in the last 24 hours. The data collected by the HKI quality control teams is later compared with the data collected by the NGO field workers. From former studies it has been shown that the confidence intervals for the same observer in operational circumstances are 1.5-2.0 cm for height, 1-2kg for weight, 1-1.5 cm for MUAC (41) and less than 2 months for age (42). The level of accuracy shown by the field workers up to December, 1991 has been very high and even comparison of measurements between different observers compares very favourably with the standards discussed in these articles.

The different NGOs are given feedback on their performance after each round, and training is given in particular areas as needed.

### Data Analysis

Data is transferred from the written recording forms to a computerized database file by the organizations collecting the information in each area. The database files are then given to HKI Statistical Unit for verification and analysis. The anthropometric indices Wt/Age, Ht/Age and Wt/Ht are calculated as percentages of the median of the National Center for Health Statistics (NCHS) reference population by using the Anthropometry Software Package CASP<sup>2</sup> developed by the Center for Disease Control (40). Further data analysis is carried out using the statistical package SPSS on personal computers. The prevalence of undernutrition using cut-off points on the anthropometric indices, is calculated for the various disaster-prone areas. The proportion of children below 2 and 3 times the standard deviation unit of the NCHS median is computed. Results are presented by sentinel point for children 6 to 59mths who are <-2 Z scores and <-3 Z scores from the median for Wt/Age, Ht/Age(stunting) and WT/Ht(wasting). The proportion of children with MUAC<125mm is

also calculated. Undernourished children, and children with nightblindness/ARI and diarrhea are identified on the socioeconomic indicators by using the analysis of variance, the chi-square test and logistic regression.

### Reports

Every two months a report is compiled on the data collected in the previous round. From 1992, interested organizations will be sent a summary highlighting the key findings. Those organizations that would like further information can contact Helen Keller International for more detailed results.

The reports describe the current conditions, identify changes since the previous round of data collection, and monitor trends over a longer period. Underlying causes of the situation are outlined and general recommendations are proposed.

The reports can be placed in the pocket at the back of this Handbook.

### Notes:

- (1) *Administratively Bangladesh is constituted of 4 Divisions, 64 Districts, 460 Upazilas and over 4000 Unions.*
- (2) *CMS Weighing Equipment Ltd., 18 Camden High Street, London NW1 0JH, UK*
- (3) *Teaching-aids At Low Costs TALC, P.O.Box 49, St Albanas, Herts, AL1 4AX, UK.*
- (4) *Center for Disease Control Anthropometry Software Program (CASP), Statistics Branch, Division of Nutrition, CCDPIIP, Centers for Disease Control, 1600 Clifton Road (MS A08), Atlanta, GA 30333, USA*

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## **NSP Publications**

- Newsletters**      Round 1; data collected April 1990.  
                         Round 2; data collected June 1990.  
                         Round 3; data collected August 1990.
- Technical Reports**      Round 4; data collected October 1990.  
                         Round 5; data collected December 1990.  
                         Round 6; data collected February 1991.  
                         Round 7; data collected April 1991.  
                         Round 8; data collected June 1991.  
                         Round 9; data collected August 1991.
- Bimonthly Reports**      Round 10; data collected October 1991.  
(New format)

### **Training Manual on Anthropometric Measurements for Health Workers**

Bangla version. Published by HKI 1991.

An English version is in progress.

For information and correspondence contact

Dr. Martin W. Bloem, Country Director  
Helen Keller International, Bangladesh  
P.O. Box 6066 Gulshan  
Dhaka - 1212, Bangladesh

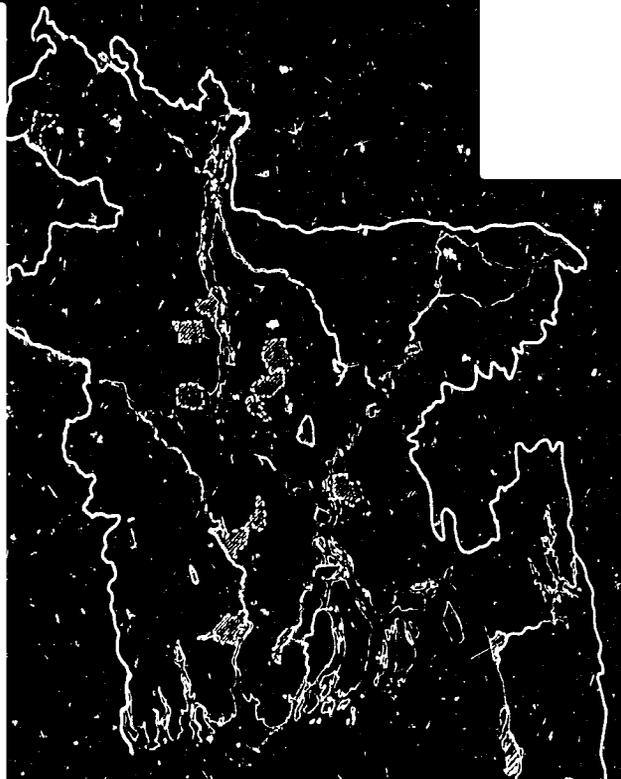
Telephone: 880 - 2 - 325628  
880 - 2 - 814234  
Fax: 880 - 2 - 813310

# Nutritional Surveillance

for Disaster Preparedness and Prevention of Nutritional Blindness

Report of Round 10

October 1991 Data Collection



*Helen Keller International  
Dhaka, Bangladesh*

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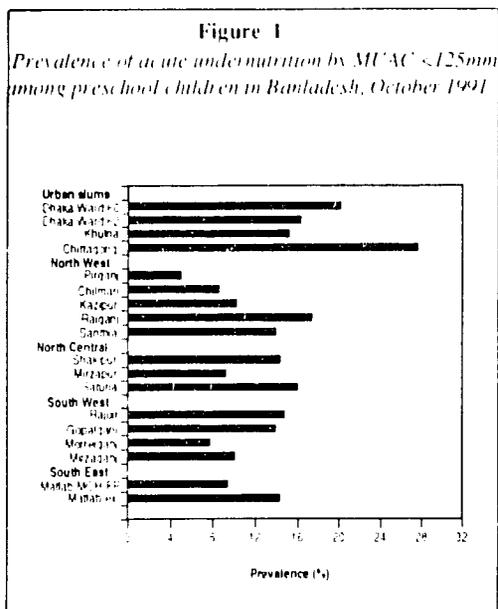
## Nutritional Surveillance For Disaster Preparedness and Prevention of Nutritional Blindness

### Report of October 1991 data collection.

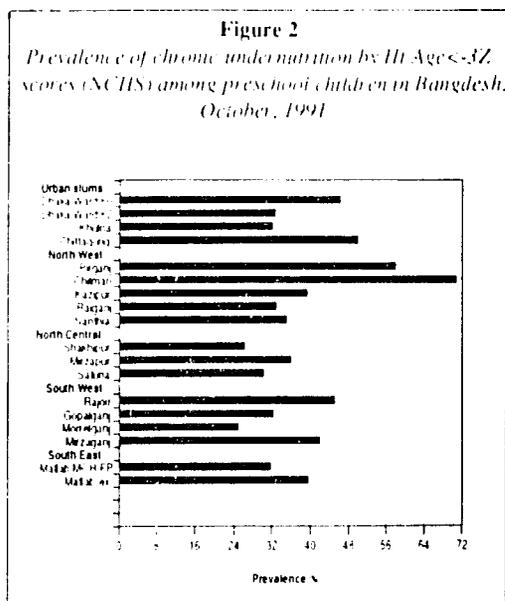
In the October round of the NSP, 4731 households were interviewed, and data was collected on the nutritional and health status of 6404 children aged 6 to 59 months.

October is at the end of the so-called 'hungry season' prior to the aman harvest in November. This period is characterized by high food prices, depleted household food stocks and weak demand for agricultural labor. August data from the NSP demonstrated increasing rates of acute undernutrition and widespread distress, indicating an early start of the 'hungry season'.

Between August and October, floods were reported in the north-west region of Bangladesh with many households recounting crop loss. Distress in these areas is obvious, as indicated by the high food prices, low wages and the widespread use of food loans and sale of assets. Although the floods might have merely acted as



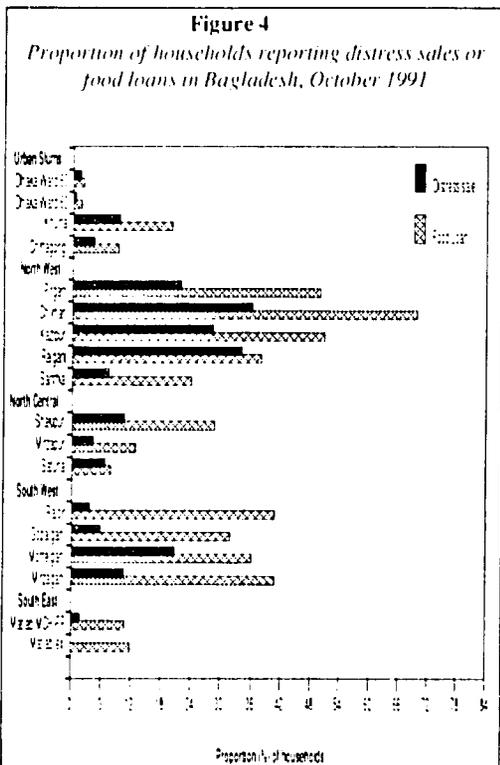
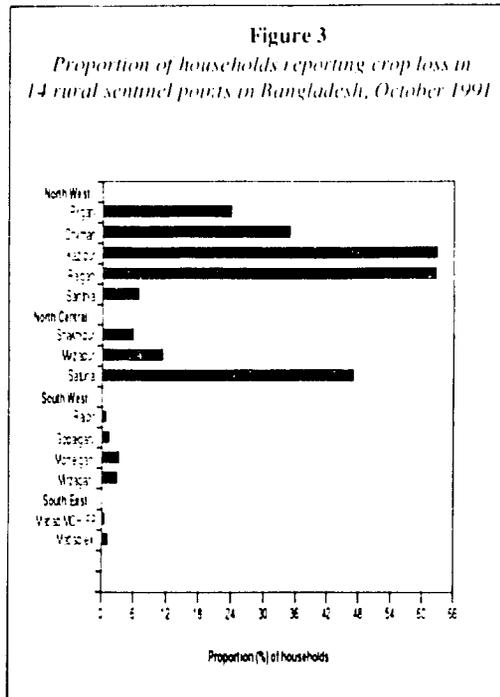
an aggravating factor on a 'normal' seasonal trend in severely impoverished areas, it is evident that the socioeconomic situation has suffered a major drawback. So far, no immediate impact on health or nutritional status could be observed.



However, it should be noted that the prevalence of chronic undernutrition remains extremely high especially in the most northern sentinel points, reflecting the poor socioeconomic background of these areas.

Apart from the flood hit areas, distress was demonstrated in most of the sentinel points. Many households are apparently not able to cope with the seasonal shortage at this time of the year, and most areas showed increasing rates of acute undernutrition. Health indicators were relatively stable in most of the rural areas. A diarrhea epidemic - reported in September and October - could not be confirmed by the NSP data.

The poor living conditions in the urban slums remain a reason for concern. Acute undernutrition was found in over one fifth of the underfives, and the prevalences of diarrhea and acute respiratory infection are higher than in the rural areas.



## Notes on the figures

### Figure 1

MUAC, or mid upper arm circumference, is a measure of wasting or acute undernutrition and is also a predictor of mortality - children with MUAC < 125mm have 8 -12 times the risk of dying compared to well nourished children. Prevalence is high throughout Bangladesh but Chittagong remains the worst affected area, especially since the cyclone.

### Figure 2

Ht/Age is a measure of skeletal stunting which is slow to develop or to resolve. It reflects chronic food shortages. The measure of -3Z scores is the proportion of children more than 3 standard deviations from the median of the National Center for Health Statistics reference population. It means that in some parts of North West Bangladesh, 60%-70% of children are stunted to a degree that is found only in 0.1% of the reference population.

## NSP regions update

The NSP rural areas have been redefined to be consistent with the five Flood Action Plan regions. These are the:

**North West region** represented by Pirganj, Chilmari, Kazipur, Raiganj and Santia..

**North Central region** represented by Shakhipur, Mirzapur and Satura.

**South West region** represented by Rajoir, Gopalganj, Morelganj and Mirzaganj.

**South East region** represented by Matlab MCH-FP and Matlab-extension. Moheshkhali and Teknaf will soon be added.

**North East region** is not included in NSP.

For information and correspondence contact

Dr. Martin W. Bloem, Country Director  
Helen Keller International Bangladesh  
P.O. Box 6066 Gulshan  
Dhaka - 1212, Bangladesh

Telephone: 880 - 2 - 325628  
880 - 2 - 814234

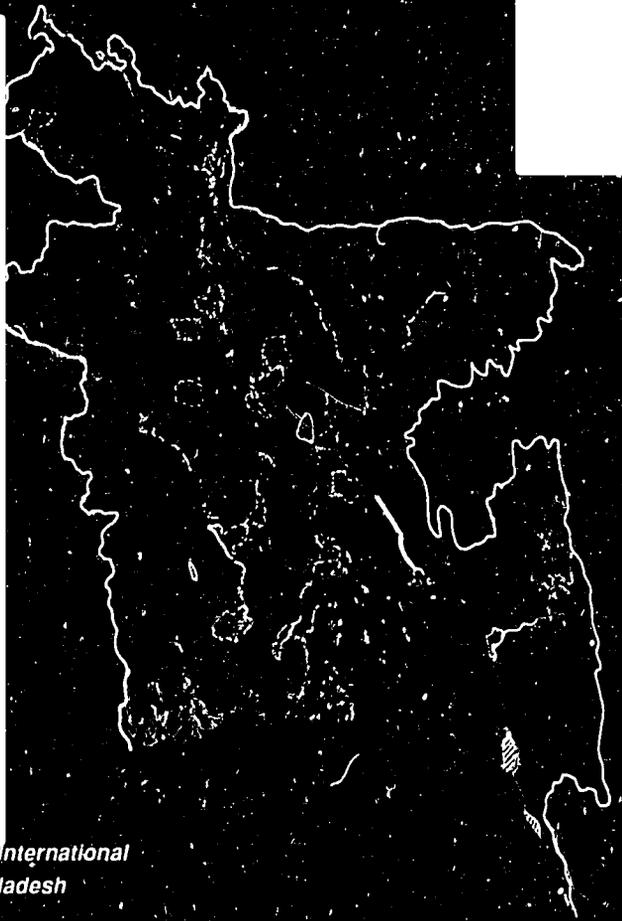
Fax: 880 - 2 - 813310

# Nutritional Surveillance

for Disaster Preparedness and Prevention of Nutritional Blindness

Report of Round 11

December 1991 Data Collection



*Helen Keller International  
Dhaka, Bangladesh*

*Place this report in the pocket at the back of the NSP Handbook.*

## Nutritional Surveillance

### For Disaster Preparedness and Prevention of Nutritional Blindness

Report of December 1991 data collection.

In the 11th round of NSP in December 1991, data was collected on the nutritional and health status of 6,951 children aged 6-59 months and 5,113 households were interviewed regarding SES and distress factors.

This was just after the Aman harvest in November. Previous studies have demonstrated that food intake increases and agricultural employment opportunities are abundant in the post harvest period. This is usually reflected in decreasing food prices, increasing salaries and rapidly declining rates of acute undernutrition, as was shown in the NSP data of December 1990.

Data collected in December 1991 showed a similar pattern. Compared with October, the prices of rice and wheat - the main staple foods - decreased, and salaries were generally higher. Acute undernutrition by MUAC declined in most sentinel points, (figure 1) but the decline was far less than that observed in December 1990, especially in the urban sentinel points. In the slums of Chittagong, a low MUAC continued to be observed in almost one fourth of children under five years of age.

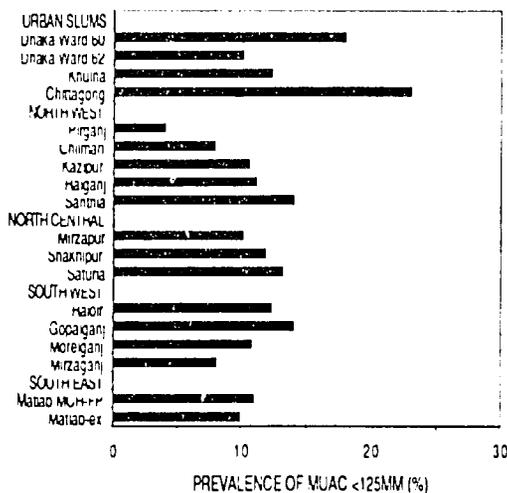
Chronic undernutrition is typically slow to develop or resolve, and the prevalence increased slightly between October and December 1991, as a reflection of the preharvest food shortages. Both chronic and acute undernutrition were more widespread in December 1991 than in the previous year, giving an indication of the severity of the distress described in the previous two reports.

VAC coverage in urban slums is high compared to the rural areas, but has dropped sharply in Chittagong and Khulna. In the rural regions, the coverage was considerably higher in the southern sentinel points, (figure 2) corresponding with lower prevalences of nightblindness in this part of the country. Nightblindness was found to be remarkably prevalent in the North Central Region (figure 3).

Socioeconomic distress on the household level, as indicated by distress sale and food loans, generally decreased (figure 4, 5). Most of the sentinel points in the North Western region have still not recovered from the socioeconomic impact of the floods. In the southern sentinel points of Morelganj and Mirzaganj distress has been rather widespread since the April 1991 cyclone. The situation has further worsened due to flooding in November, causing crop loss for over one fifth of the households.

**Figure 1**

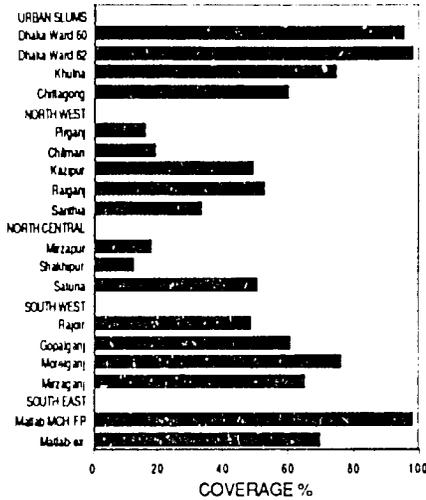
*Prevalence of acute undernutrition among preschool children in 4 urban slums and 14 rural sentinel points in Bangladesh, December 1991*



MUAC, or mid upper arm circumference, is a measure of wasting or acute undernutrition and is also a predictor of mortality - children with MUAC < 125mm have 8-12 times the risk of dying compared to well nourished children.

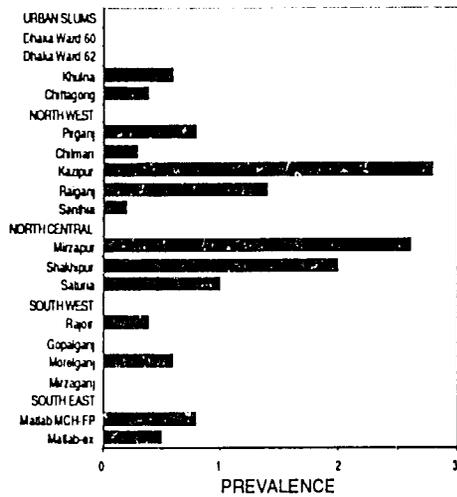
**Figure 2**

*Coverage of VAC distribution among preschool children in 4 urban slums and 14 rural sentinel points in Bangladesh, December 1991*



**Figure 3**

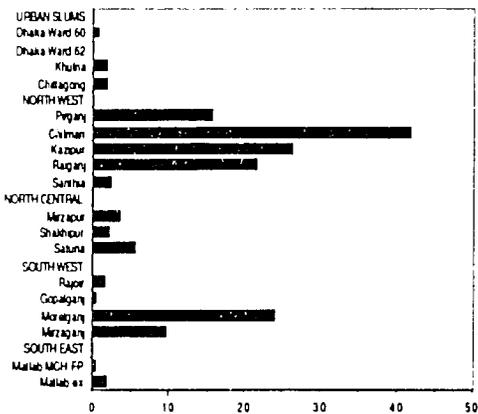
*Prevalence of nightblindness among preschool children in 4 urban slums and 14 rural sentinel points in Bangladesh, December 1991*



Nightblindness is an early sign of Vitamin A deficiency, the leading cause of blindness in preschool children in developing countries. Children with Vitamin A deficiency have a higher risk of anaemia, diarrhea and respiratory diseases, and a risk of mortality 4 to 12 times higher than non-deficient children. In former NSP reports it has been shown that there is a strong association between VAC (vitamin A capsule) distribution and the prevalence of nightblindness. Figures 2 and 3 demonstrate that areas with high VAC coverage generally have low prevalence of nightblindness, and vice versa.

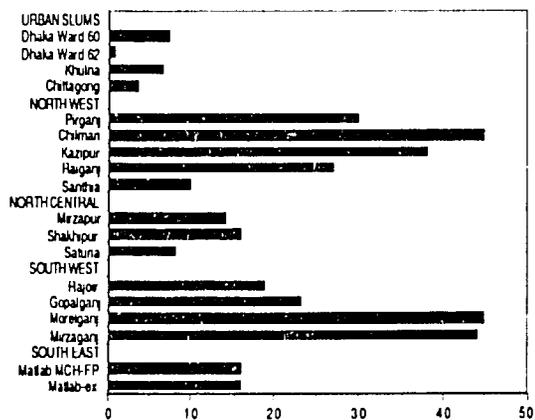
**Figure 4**

*Proportion of households reporting distress sale in 4 urban slums and 14 rural sentinel points in Bangladesh, December 1991*



**Figure 5**

*Proportion of households reporting food loans in 4 urban slums and 14 rural sentinel points in Bangladesh, December 1991*



Food loans and distress sale generally are useful indicators of distress at a household level. However, they are dependent on availability of food loans and items for sale. This should be borne in mind when interpreting results, especially in the urban slums.

For information and correspondence  
contact:

Dr. Martin W. Bloem, Country Director  
Helen Keller International Bangladesh  
P.O. Box 6066 Gulshan  
Dhaka - 1212, Bangladesh

Telephone: 880 - 2 - 325628

880 - 2 - 814234

Fax: 880 - 2 - 813310

# Nutritional Surveillance

for Disaster Preparedness and Prevention of Nutritional Blindness

Report of Round 12

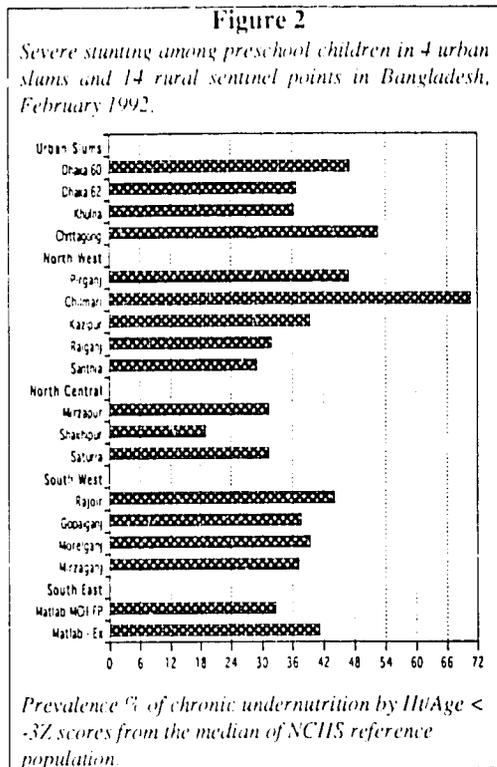
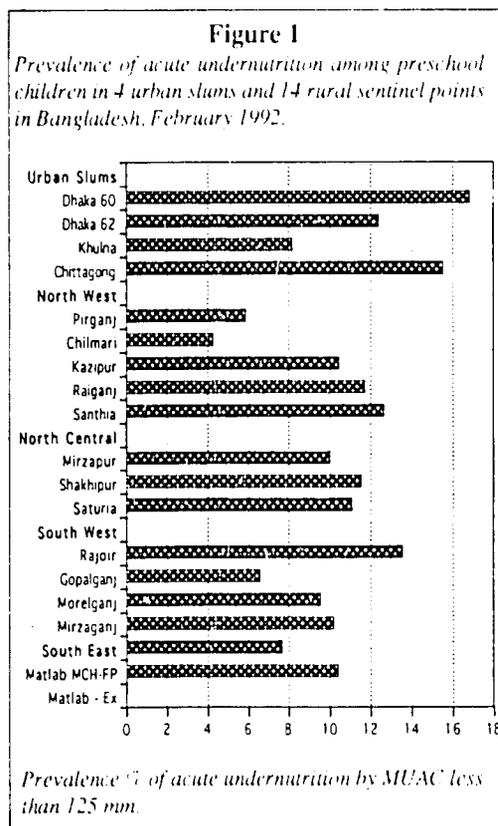
February 1992 Data Collection

## Nutritional Surveillance For Disaster Preparedness and Prevention of Nutritional Blindness

Report of February 1992 data collection.

In the February round of the NSP, data was collected on the nutritional and health status of 7,107 children aged 6-59 months and 4,230 households were interviewed regarding socio-economic and distress status.

February and March are generally characterized by adequate food supply following the harvest in November/December. However, at the end of 1991, the harvest was damaged by floods in the NW regions and in parts of the SW region. Crop loss was evident in these regions in the October and December rounds of the NSP. Consequently, food supply has probably not been as abundant as in some other years. In general, the situation



assessed by NSP indicators is currently not as favourable as in February 1991.

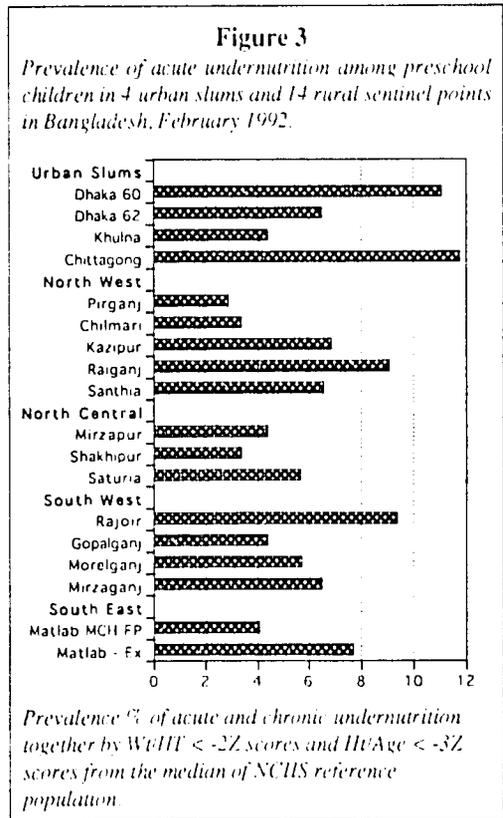
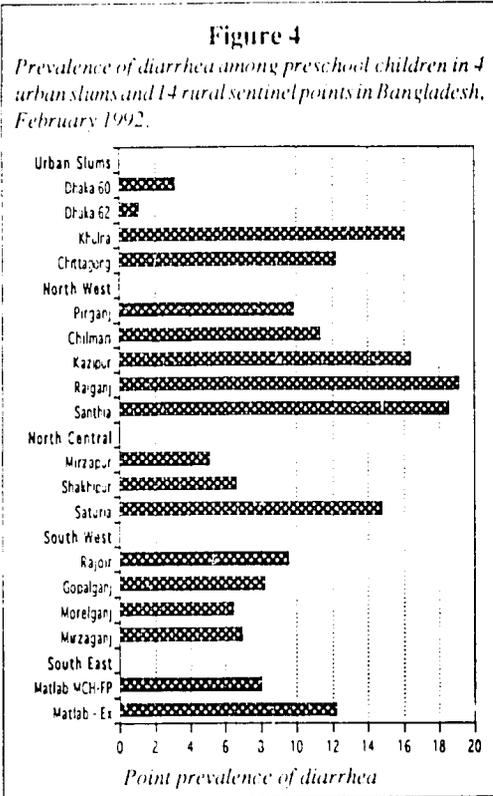
In the urban slums nutrition is generally worse than in the rural regions. Acute undernutrition by MUAC and Wt/Ht (wasting), chronic undernutrition by Ht/Age (stunting) and combined acute and chronic undernutrition (wasting and stunting) shows a higher prevalence in the Dhaka and Chittagong slums in particular (figures 1, 2 & 3). Compared with December however, there has been improvement in the nutritional status in the city slums of Chittagong and Khulna.

In the rural regions stunting remains highest in Chilmar and Pirganj in the NW. Since December, most rural sentinel points showed an improvement in chronic undernutrition but Pirganj, Chilmar and Mirzapur in particular had a considerably higher prevalence of stunting. Acute undernutrition generally remained much the same as in December for most sentinel points; the most

notable exception was Shakhipur which showed a sizeable increase in the prevalence of wasting.

Acute respiratory infection prevalence was low in all areas and was virtually unchanged since December, except in Mirzaganj where it increased. The prevalence of diarrhea generally decreased since December - the worst affected areas were Khulna and parts of the NW region (figure 4). Nightblindness on average decreased since December; rural levels were somewhat higher than urban slums and a level of over 1% was found in Raiganj, Mirzapur and Mirzaganj.

Even though food market prices were higher in both the slums and rural regions, socioeconomic and distress level indicators mostly improved since December. Salaries were higher in the slums although the proportion of people dependent on uncertain day to day employment remained unchanged at a high 40-50% in Dhaka-



60 and Chittagong slums. In the rural sentinel points, crop loss was virtually nil. Distress sales were at a low level and had generally decreased since December. Food loans were mostly less, although Morelganj remained at 43% and some increase since December was noted in Mirzapur, Sataria and Rajoir.

Even though the situation has somewhat generally improved since December in the city slums, Dhaka-60 and Chittagong remain areas of concern. In the rural regions, the overall average of most indicators was similar to December with some individual sentinel points showing a tendency towards improvement and some towards a possibly worsening trend. The percent prevalence of wasting (by MUAC < 125mm) increased by varying amounts in 6 of 14 sentinel points and stunting became more prevalent in 7 of 14 rural sentinel points.

## Collaborating Organizations

Aga Khan Community Health Project	(AKGHP)
Bangladesh Rural Advancement Committee	(BRAC)
Bangladesh Red Crescent Society	(BDRCS)
Cooperative for American Relief Everywhere CONCERN	(CARE Bangladesh)
Gono Unnayan Prochesta	(GUP)
International Center for Diarrhoeal Disease Research, Bangladesh	(ICDDR,B)
Rangpur Dinajpur Rural Services	(RDRS)
United Nations Children's Fund	(UNICEF)

For information and correspondence  
contact:

Dr. Martin W. Bloem, Country Director  
Helen Keller International Bangladesh  
P.O. Box 6066 Gulshan  
Dhaka - 1212, Bangladesh

Telephone: 880-2-325628  
880-2-814234  
880-2-314408  
Fax: 880-2-813310

This project is funded by the United States Agency for International Development



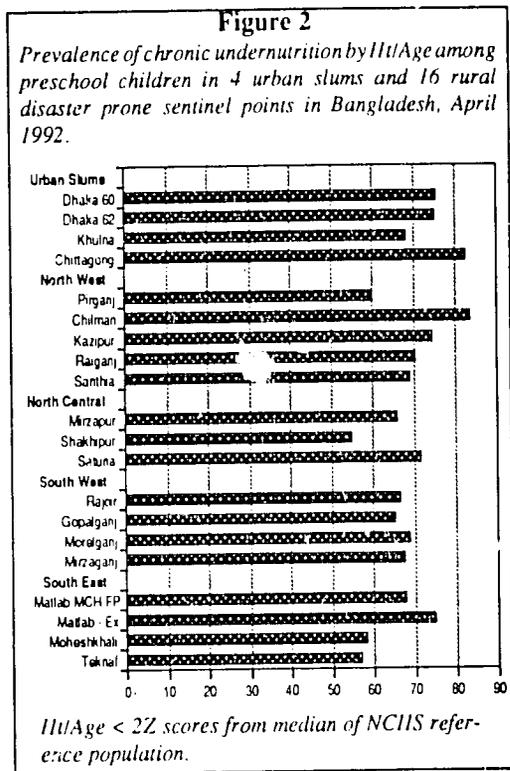
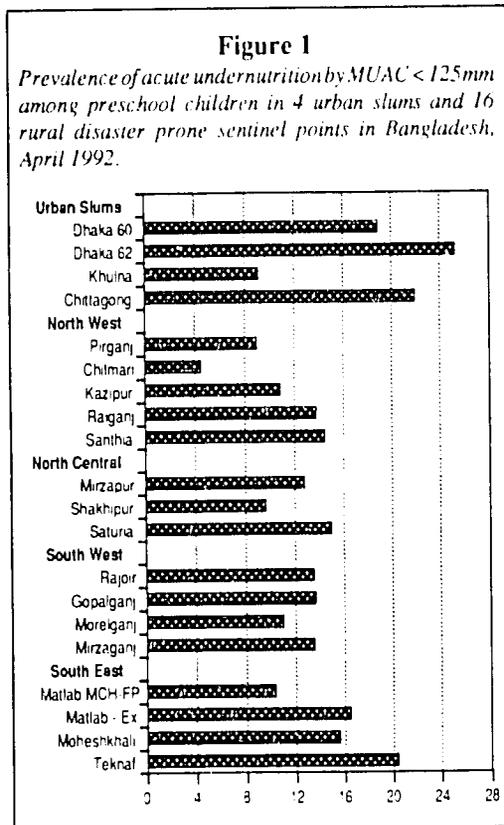
## Nutritional Surveillance For Disaster Preparedness and Prevention of Nutritional Blindness

### Report of April 1992 data collection.

In the 13th round of NSP in April 1992, data was collected on the nutritional and health status of 7,575 children aged 6 to 59 months and 5,477 households were interviewed regarding socio-economic status and distress factors.

Demand for agricultural labour is usually abundant at this time of the year and wages are consequently relatively high.

Due to drought in most parts of Bangladesh a considerable proportion of the Boro-rice, the second-most important rice-crop to be harvested in May-June, was lost. Possible negative effects on the nutritional status can only be expected in



the next rounds of data-collection.

In this report of the NSP, the first data are included on the expansion of surveillance activities to the sentinel points of Moheshkhali and Teknaf in the southeastern region. The south-eastern coastal belt is cyclone-prone, and was badly affected by the cyclone that hit Bangladesh in April 1991.

The socioeconomic status seems to be rather favourable compared to the other rural sentinel points, except for the level of education, which is the lowest found in rural areas.

Both Upazilas show very high rates of acute undernutrition: the proportion of children with MUAC below 125 mm is higher than observed in the other rural sentinel points. Stunting is less prevalent and well below the rural average. The point prevalence of diarrhea is extremely high, 33.9% in Teknaf and 56.0% in Moheshkhali. A high proportion of children in Moheshkhali had

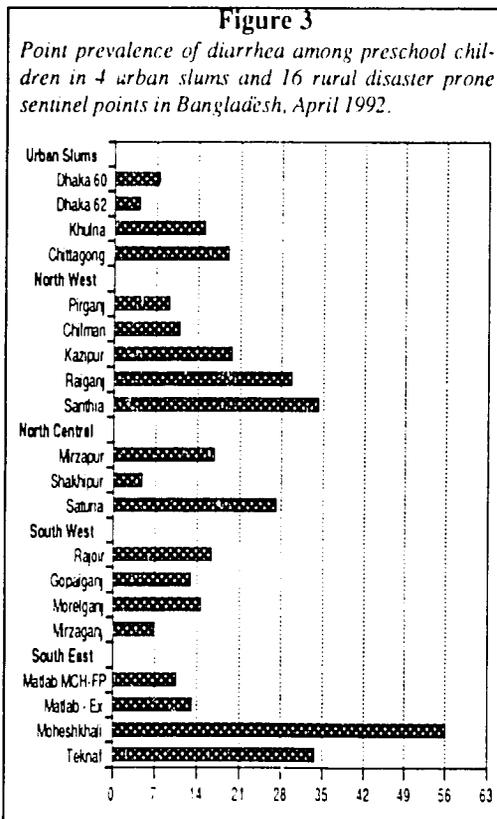
a low weight for height, possibly due to the high prevalence of diarrhea.

Although the data on socioeconomic status show only minor variations compared to February, rates of undernutrition in both the urban and rural sentinel points are considerably higher than observed in the previous round.

In the urban areas the prevalence of acute undernutrition by MUAC increased since February to 17.3%, a rate usually experienced only in the seasonal hardship period between August and November. Acute undernutrition is especially prevalent in the slums of Dhaka-Ward 62 and Chittagong, where approximately one fourth of the children has a MUAC below 125 mm. The prevalences in Dhaka-Ward 60 and Khulna remained more or less stable. The point prevalence of diarrhea increased in all four slums.

The same trend in nutritional status can be observed in the rural areas. Most sentinel points demonstrate higher rates of acute undernutrition compared to February. The rural average of MUAC <125mm increased from 9.9% to 12.7%, the highest mean ever observed in two years of data collection in the NSP. The inclusion of the two new sentinel points of Teknaf and Moheshkhali can only partly account for this high rate. Presently it is not possible to explain this sudden worsening of the nutritional situation found in most of the sentinel points. The trend is worrying, even more so since only a marginal Boro-harvest can be expected in the coming months.

As in the urban slums, an increase in diarrheal prevalence was found in most of the rural areas. Point prevalences of over 25% were found in Santhia and Raiganj (Northwest), Saturia (North central) and Teknaf and Moheshkhali (South-east).



### Round 13 Notes

•The NSP now includes Moheshkhali and Teknaf in the South East Region.

•Chronic undernutrition will now be shown as the proportion of children < -2Z scores from the median of the NCHS reference population. Former data was shown for < -3Z scores. The new cutoff is consistent with the level used to show stunting in most other parts of the world.

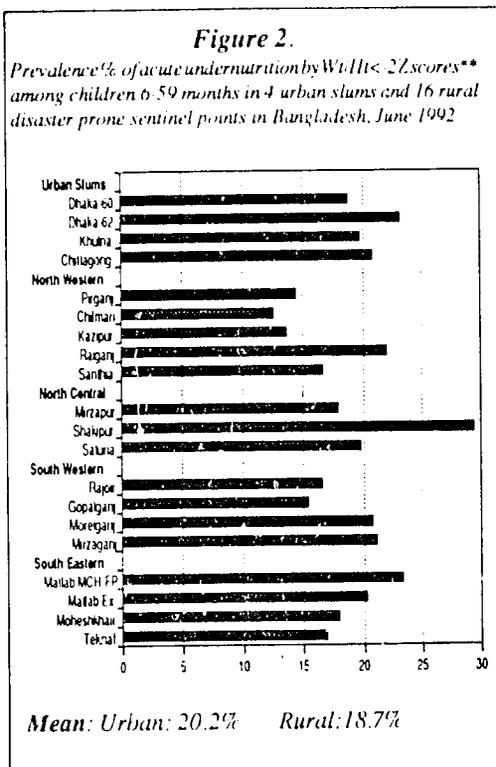
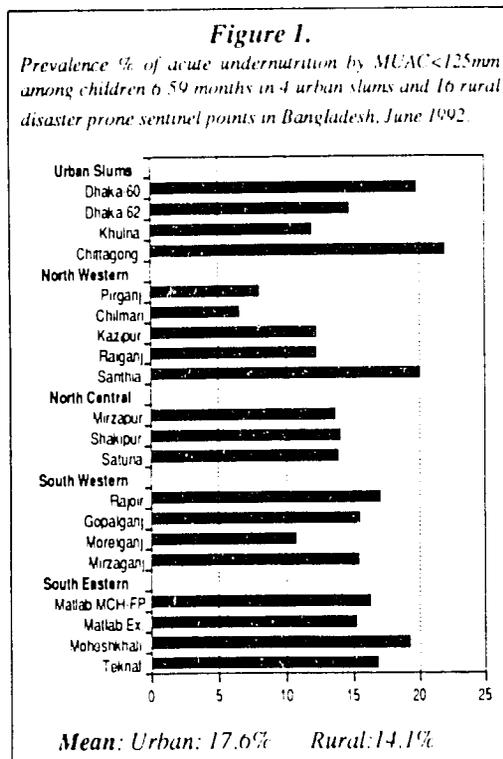


# Nutritional Surveillance For Disaster Preparedness and Prevention of Nutritional Blindness

Report of June 1992 data collection.

In the June Round of the NSP, nutritional and health data were collected from 7,645 children aged 6 to 59 months and 5,467 households were interviewed regarding socioeconomic and distress factors.

May/June is the time of the Boro rice harvest which has become an increasingly important source of rice for Bangladesh as a whole.\* Nevertheless, in the three years of data collection from NSP disaster prone thanas and urban slums, acute undernutrition has shown increasing levels in June compared with rates earlier in the year. Despite a good total Boro production in 1992\*, undernutrition has been generally more widespread in April and June this year compared with 1990 and 1991.



The areas of highest acute undernutrition in June 1992 are shown in Figure 1 (by MUAC) and Figure 2 (by Wt/Ht).

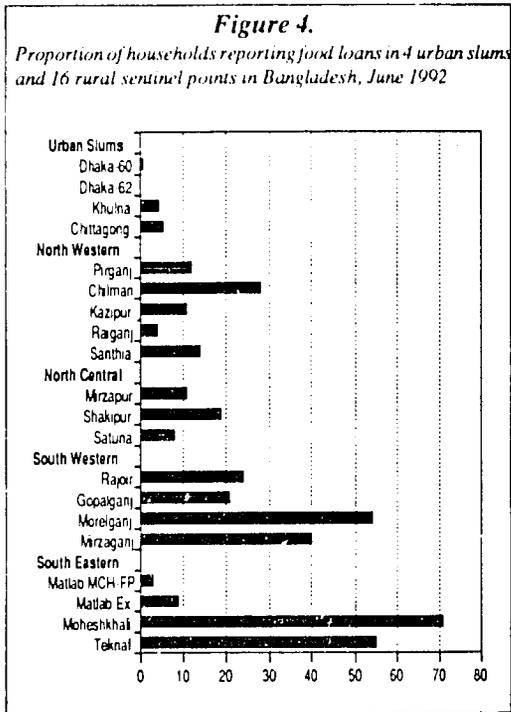
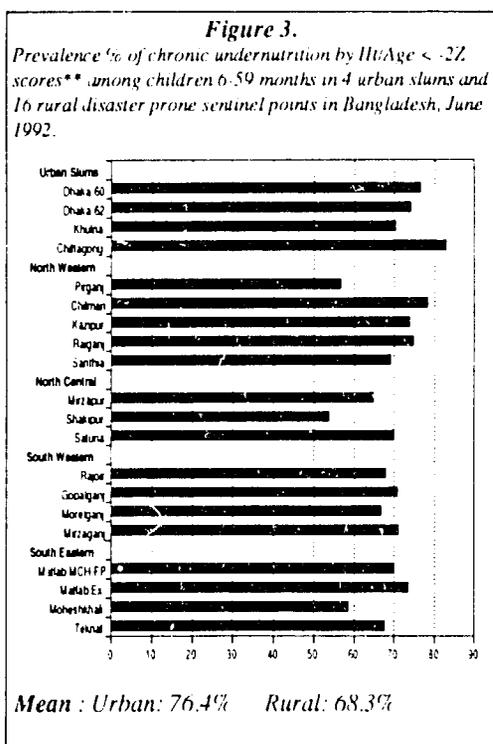
Compared with April 1992, acute undernutrition was generally increased in June in both the urban and rural areas. The June figures show varying degrees of increase of wasting in 12 of 20 sentinel points by MUAC, and in 15 of 20 sentinel points by Wt/Ht. Chronic undernutrition or stunting, was slightly higher in June compared with April in the urban slums but was much the same in most rural areas. The level of stunting in the different sentinel points is shown in Figure 3 (Ht/Age < 2 Z scores).

Compared with June in the last two years, the overall prevalence of wasting is higher in both the urban and rural regions. Some individual sentinel points had notably higher June levels of wasting this year: a proportional increase of at least 40% in undernutrition by MUAC < 125mm was seen in Dhaka-60 and Dhaka-62, Santhia

and Shakhipur (compared with both June 1990 and June 1991 figures) and Mirzaganj (only June 1991 figures available). Chronic undernutrition shows an increase in the overall urban rate in June 1992 compared with June in the last 2 years. The overall rural rate is similar this year to 1991, and higher than 1990.

Urban slum nutritional status is generally worse than rural status in this round. The overall urban slum levels of both wasting and stunting are higher than overall rural levels.

Health indicators were generally similar to April. The pattern of diarrhoea remained at much the same level in many thanas - the worst affected sentinel points with a point prevalence over 20% were Raiganj, Santhia, Rajoir, Gopalganj, Moheshkhali and Teknaf. Nightblindness showed improvement in some areas but was 1% or over in Pirganj, Shakhipur, and Matlab-ex. VAC distribution was higher than April, reflecting the distribution of capsules by the GOB program in April/May.



Socioeconomic status in the urban slums was similar to April. Distress sales and food loans were low. Generally the urban market price of rice decreased- only Chittagong showed an increase - but urban weekly salary of casual workers also decreased slightly.

In the rural regions the overall weekly salary of casual workers was unchanged since April, but fell to less than 100 Taka in Raiganj and Shakhipur. The average rural market price of rice fell slightly, and other staple food prices were similar to April. Crop loss was minimal in all sentinel points and distress sales were generally low. Food loans were received by 20% of the total rural population; thana levels are shown in Figure 4.

Generally undernutrition was at a higher level in NSP areas in June 1992, although the reason for this is not clear.

\* *Crop Outlook Report, Office of Food and Agriculture, USAID, July, 1992.*  
 \*\* *Z scores are from the median of the NCHS reference population.*

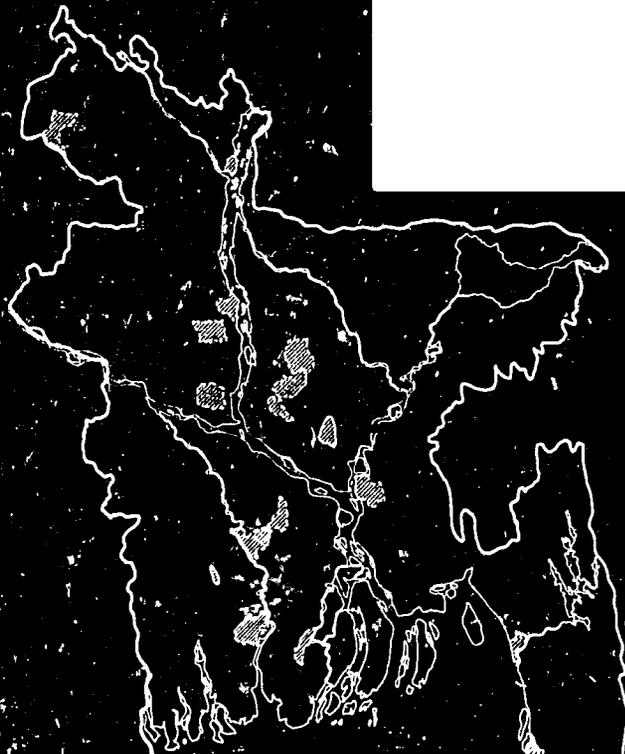


# Nutritional Surveillance

for Disaster Preparedness and Prevention of Nutritional Blindness

Report of Round 15

August 1992 Data Collection



**HKI/IPHN**

*Helen Keller International &  
Institute of Public Health Nutrition  
Dhaka, Bangladesh*

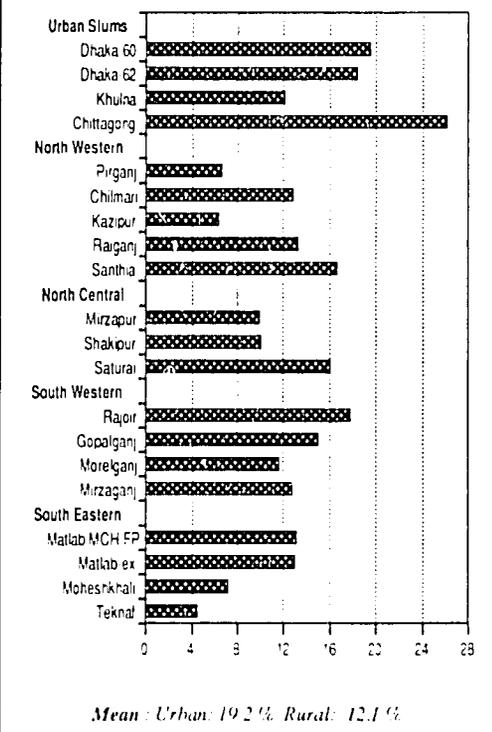
# Nutritional Surveillance for Disaster Preparedness and Prevention of Nutritional Blind- ness.

## Report of August 1992 data collection.

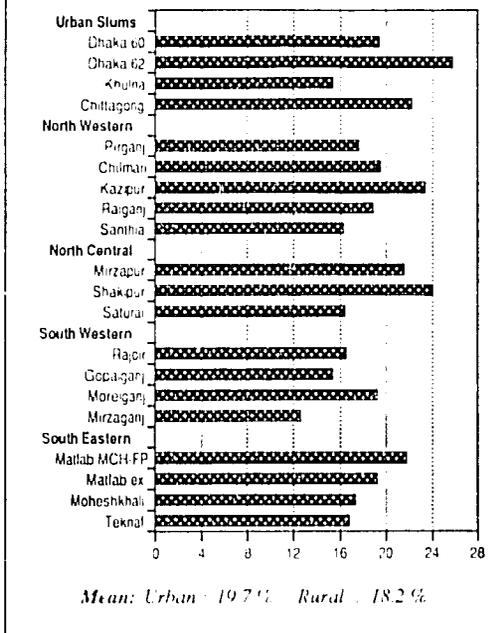
In the August round of the NSP, nutritional and health data were collected from 8,100 children aged 6 to 59 months and 5,786 households were interviewed regarding socioeconomic and distress factors.

Between May and July both the Aus and Boro rice crops have been harvested. Output from the Aus crop is estimated to have fallen, whereas the Boro crop was generally good, however with wide variations between different regions. Over the last few years the Boro rice harvest has become an increasingly important source of rice for Bangladesh as a whole, whereas Aus harvest outputs have generally declined. \*

**Figure 1.**  
*Prevalence % of acute undernutrition by MUAC < 125mm among children 6-59 months in 4 urban slums and 16 rural disaster prone sentinel points in Bangladesh, August 1992.*



**Figure 2.**  
*Prevalence % of acute undernutrition by weight for height below -2 Z scores among children 6-59 months in 4 urban slums and 16 rural disaster prone sentinel points in Bangladesh, August 1992.*



In contrast with the rather favorable reports on agricultural outputs during the past year, both chronic and acute undernutrition remain widespread among underfives and the overall nutritional status of Bangladeshi children is alarming.

The areas of highest acute undernutrition in August 1992 are shown in Figure 1 (by MUAC) and Figure 2 (by WFH).

General rates of acute undernutrition by MUAC < 125 mm changed little since June in both urban and rural areas, but there were marked variations between the different rural sentinel points. High prevalences of over 15% were found in the urban slums of Dhaka and Chittagong, and in the rural thanas Santhia, Saturia, Rajoir and Gopalganj.

Weight for height below -2 Z scores is a widely used indicator of acute undernutrition. Internationally accepted value judgements, developed by WHO, state that a prevalence of 10 to 15% should be considered as 'serious', while prevalence rates exceeding 15% should be valued as 'critical'. Of the twenty sentinel points of the NSP, Mirzaganj demonstrates a 'serious' rate of undernutrition, while all other sentinel points show the nutritional status as 'critical'.

The level of stunting by height for age below -2 Z scores in the different sentinel points is shown in Figure 3.

Rates of chronic undernutrition are highest in the urban slums, where generally three out of four children under five years are short for their age. Rates in the rural areas are only marginally lower, and still alarmingly high at approximately 68%. These high rates reflect the overall poor socioeconomic status of Bangladeshi households, since poverty is regarded as the basic cause for stunting. Its implications are serious, since stunted children have a higher risk of morbidity and mortality, and their cognitive development is likely to be negatively affected.

Health indicators changed little since June. The point prevalence of diarrhea decreased slightly in most of the thanas. The areas most at risk, with prevalences of over 20%, were found in Kazipur, Santhia and Moheshkahali (Figure 4).

Nightblindness is relatively uncommon in the urban slums, where coverage of vitamin A capsule distribution is close to 100%. In the rural areas there is a wide variation between the

Figure 3.

Prevalence % of chronic undernutrition by height for age below -2 Z scores among children 6-59 months in 4 urban slums and 16 rural disaster prone sentinel points in Bangladesh, August 1992

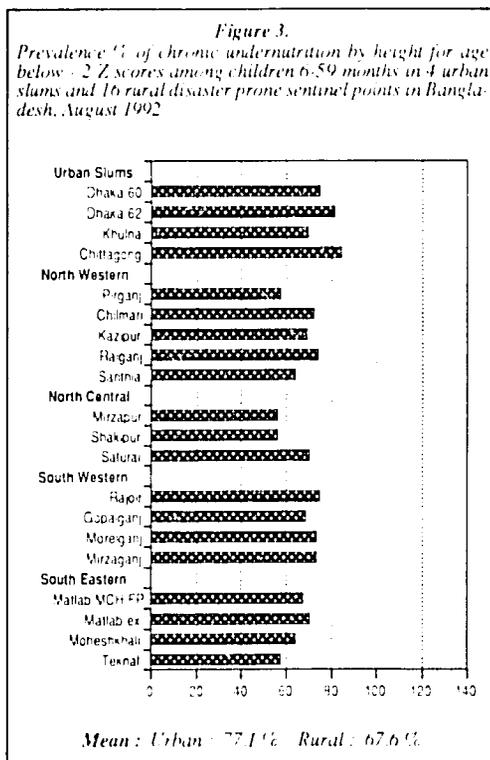
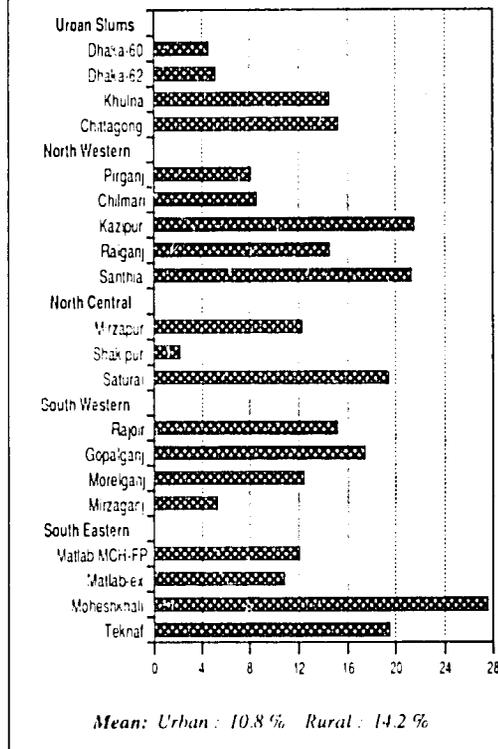


Figure 4.

Point prevalence % of diarrhea among children 6-59 months in 4 urban slums and 16 rural disaster prone sentinel points in Bangladesh, August 1992



sentinel points, with prevalences of 1% or more in Pirganj, Chilmari, Raiganj, Rajoir and Matlab MCH-FP.

Socioeconomic indicators showed some minor changes compared to June. Although NSP data collected in August 1990 and August 1991 clearly indicated the beginning of the pre (Aman) harvest season, characterized by depleting food stocks, decreasing wages, increasing prices and rising rates of acute undernutrition, this is less significant in the August 1992 data. Distress at the household level, as indicated by the percentages of households reporting distress sale and/or food loans, is still at a relatively low level. Food prices for rice and lentils declined in most sentinel points, whereas prices for wheat flour and oil remained pretty much the same.

\* Sources:

1. Food Outlook, FAO, October 1992
2. Crop Outlook Report, Office of Food and Agriculture, USAID, July 1992

## Collaborating Organizations

Aga Khan Community Health Project  
Bangladesh Rural Advancement Committee  
Bangladesh Red Crescent Society  
Cooperative for American Relief Everywhere  
CONCERN  
Gono Unnayan Prochesta  
International Center for Diarrhoeal  
Disease Research, Bangladesh  
Rangpur Dinajpur Rural Services  
United Nations Children's Fund

(AKCHP)  
(BRAC)  
(BDRCS)  
(CARE Bangladesh)  
(GUP)  
(ICDDR,B)  
(RDRS)  
(UNICEF)

For information and correspondence  
contact:

Dr. Martin W. Bloem, Country Director  
Helen Keller International Bangladesh  
P.O. Box 6066 Gulshan  
Dhaka -1212, Bangladesh

Telephone: 880-2-325628  
880-2-814234  
Fax: 880-2-813310

This project is funded by the United States Agency for International Development

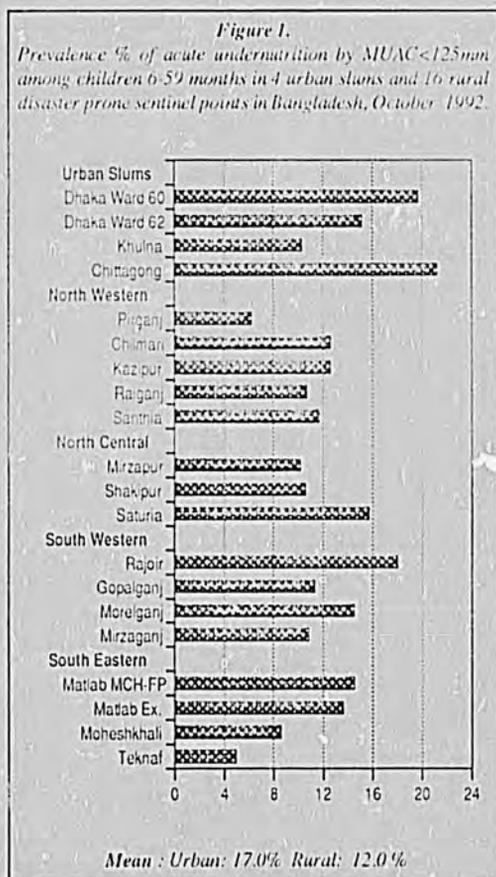


# Nutritional Surveillance for Disaster Preparedness and Prevention of Nutritional Blindness

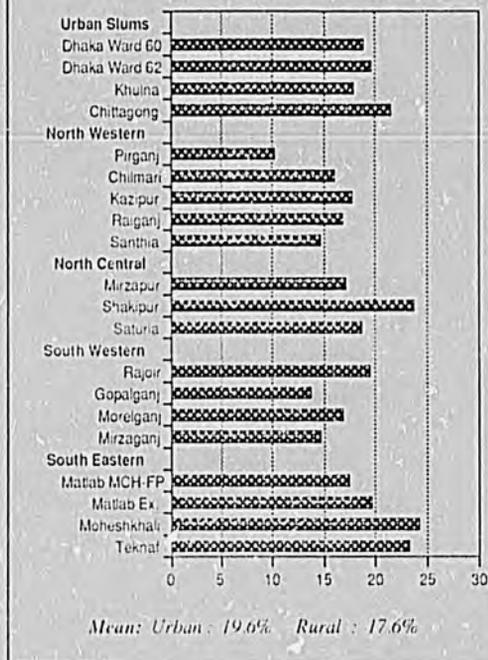
## Report of October 1992 data collection.

In the October round of NSP, nutritional and health data were collected from 7,874 children aged 6 to 59 months and 5,834 households were interviewed regarding socioeconomic and distress factors.

The Aman crop, still the main source of rice in Bangladesh, is due to be harvested in November. Expectations are generally good, though variations remain. In areas where irrigation techniques have been used, bumper harvests are reported. In other areas the output has been adversely affected by dry weather in the planting



**Figure 2.**  
Prevalence % of acute undernutrition by weight for height below -2 Z scores among children 6-59 months in 4 urban slums and 16 rural disaster prone sentinel points in Bangladesh, October 1992



season. In 1990 and 1991, NSP data collected in October showed increasing food prices, widespread distress and high rates of undernutrition, characteristic of the so-called 'hungry season' prior to the Aman harvest.

In contrast with observations made in previous years, only minor variations were found between August and October 1992. Acute undernutrition by MUAC declined in most of the urban slums, except for Dhaka ward 60. In the rural areas, little changes were observed compared to August. Rates of acute undernutrition by weight for height, and rates of chronic undernutrition by height for age remained more or less the same in both the urban and rural sentinel points. In 1992, rates of undernutrition in the underfives increased to a peak level (usually only observed in August and October) as early as April, and have been fairly stable since then. It should be noted however, that rates of undernutrition in Bangladeshi children are unacceptably high by any standard.

A fairly stable nutritional status should therefore not be interpreted as a necessarily 'positive' situation.

The point prevalence of diarrhea has generally declined. High prevalences of over 20% were found in Saturia, Rajoir and Moheshkali. The ARI prevalence is increasing in both rural and urban areas. Upper respiratory tract infections are very common, with approximately two third of the children being affected.

The point prevalence of nightblindness increased in the rural areas. This might be explained by the fact that the last round of VAC distribution took place in April/May, and not all sentinel points were covered by the October/November distribution round. Prevalences of over 1% (the WHO threshold for the existence of a problem of vitamin A deficiency in the community) were found in Chilmari, Kazipur, Mirzapur, Shakipur, Rajoir and Gopalganj. In Raiganj the prevalence was even as high as 5.2%.

Figure 3.

Prevalence % of chronic undernutrition by height for age below -2 Z scores among children 6-59 months in 4 urban slums and 16 rural disaster prone sentinel points in Bangladesh, October 1992

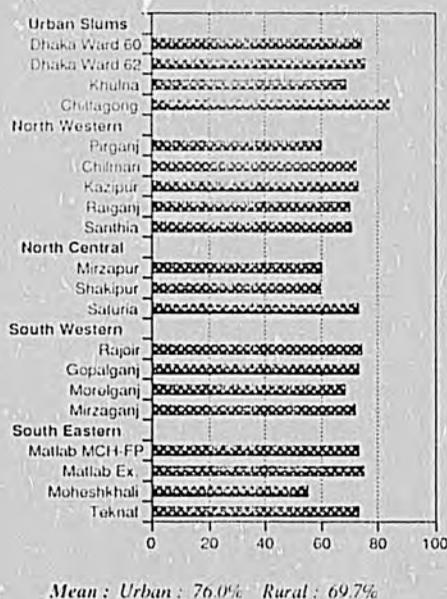
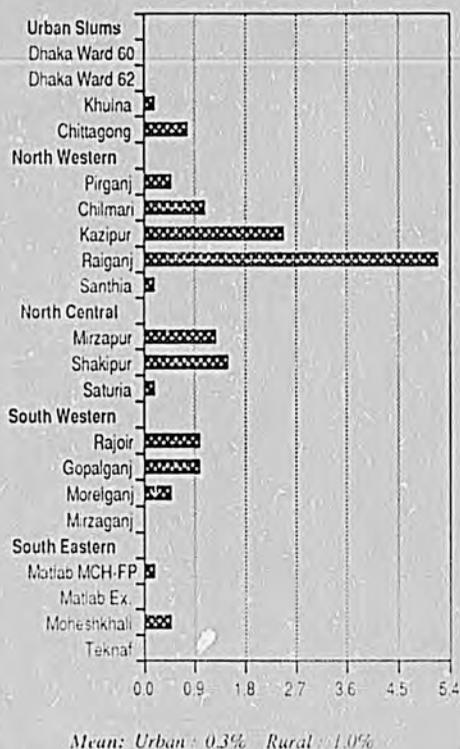


Figure 4.

Point prevalence % of nightblindness among children aged 6-59 months in 4 urban slums and 16 rural disaster prone sentinel points in Bangladesh, October 1992



Socioeconomic variables remained more or less the same in both the rural and urban areas. Prices of basic food items declined in most sentinel points. The north western region showed an especially sharp drop in the market prices of rice and wheat. Distress at the household level (as indicated by the proportion of households reporting food loans or distress sale) is evident, however not as widespread as in October 1991.

As a conclusion it can be said that nutritional and socioeconomic data have been rather stable during the past few months, and not as characteristic of the traditional 'hungry season' as observed in previous years of data collection. The increasing importance of the Boro crop, harvested in May-June, might contribute to a modification of 'normal' seasonal trends, however, a longer follow up period is necessary to draw any definite conclusions on this.



# Nutritional Surveillance

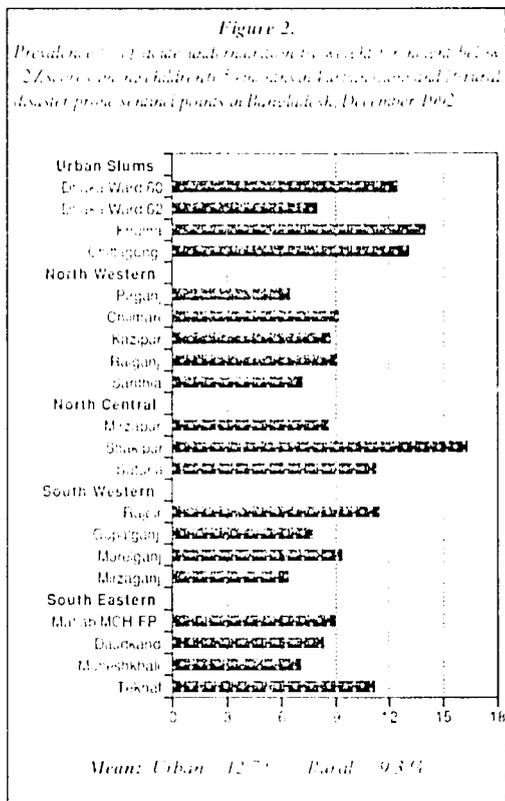
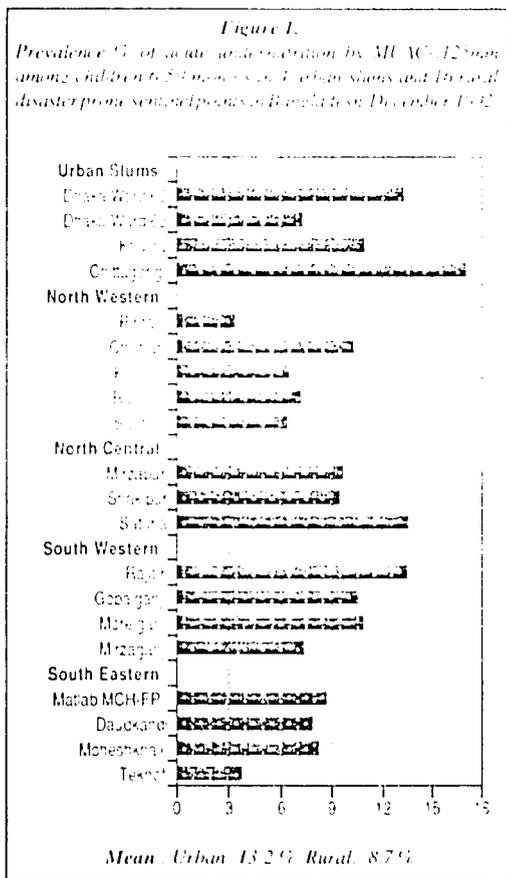
# Nutritional Surveillance

# Nutritional Surveillance for Disaster Preparedness and Prevention of Nutritional Blindness

## Report of December 1992 data collection

In the December round of NSP, nutritional and health data were collected from 8,898 children aged 6 to 59 months and 6,453 households were interviewed regarding socioeconomic and distress factors.

Data was collected immediately after the Aman harvest, which is still the main source of rice in Bangladesh. The 1992 harvest was generally good, and bumper harvests were reported from different areas. As in previous years of the NSP, the December data show a sharp drop in the rates of acute undernutrition in under fives.



Rates of acute undernutrition are shown in figure 1 & 2.

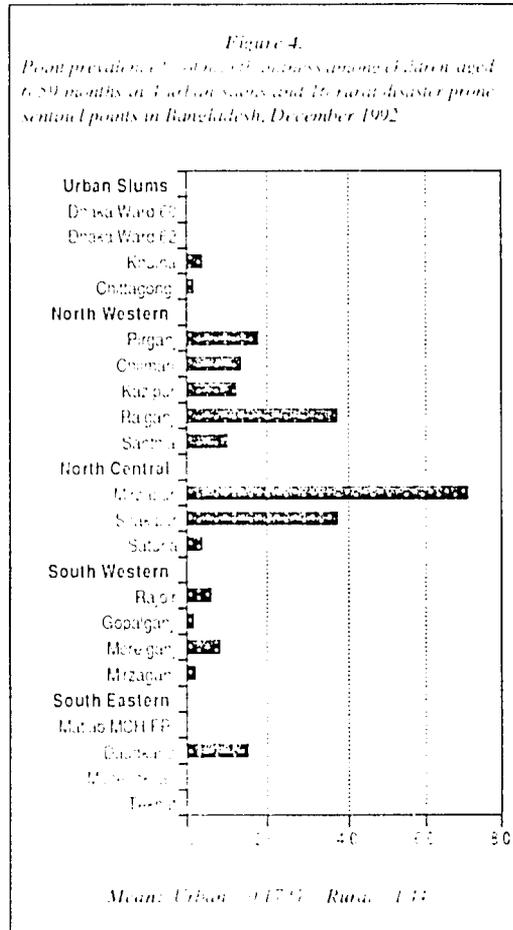
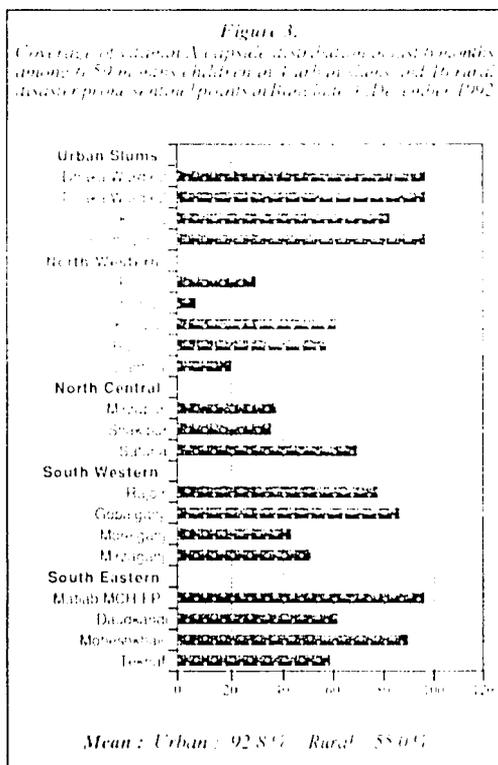
The decline in acute undernutrition by weight for height below -2 Z-scores was most remarkable, rates dropped from 19.6% to 12.7% in the urban slums and from 17.0% to 9.3% in the rural areas. Mid Upper Arm Circumference is a somewhat slower indicator, proportions of children with a MUAC below 125 mm dropped from 17.0% to 13.2% in the urban slums, and from 12.0% to 8.7% in the rural areas. Rates of acute undernutrition in the urban slums by both indicators are lower than observed in the 1990 and 1991 December rounds of the NSP. In the rural areas little differences were seen between the previous years and 1992 data. Chronic undernutrition is typically slow to develop or resolve, and the effect of increased food intake following the Aman harvest might only become apparent after some months.

The point prevalence of diarrhea was rather low

in both the urban and rural sentinel points at around 10%. At risk sentinel points, with prevalences over 15%, were found in Raiganj, Santhia, Moheshkali and Teknaf.

A round of distribution of vitamin A capsules took place October and November, reaching approximately 93% of the urban and 55% of the rural children (Fig. 3). The coverage in the rural area showed wide variation which is reflected in point prevalences of nightblindness ranging from 0% to as high as 7.4 (Fig. 4). Area at high risk of nightblindness had generally lower coverage of VAC.

Socioeconomic data show decreasing distress at the household level since October 1992. Compared to December 1991, distress is presently much less widespread, especially in the rural areas. Salaries have increased since October 1992 in all sentinel points, as a reflection of an increased demand for labour in the post harvest season.



The drop in the price of rice, observed in the October round of NSP, has continued. This drop has been most notable in the rural areas, and especially in the North Western Region. Prices are at the lowest level in the history of NSP, most probably reflecting a surplus of rice on the market.

In conclusion, the favourable Aman output, harvested in November, has likely been an important factor in the observed improvement of the health and nutritional status of young children and improved socioeconomic conditions of the households, as indicated by decreased distress and increased salaries. The market price of rice is extremely low, especially in the rural areas. Unexplained, but worrying is the high prevalence of night blindness, despite a recent round of vitamin A capsule distribution.





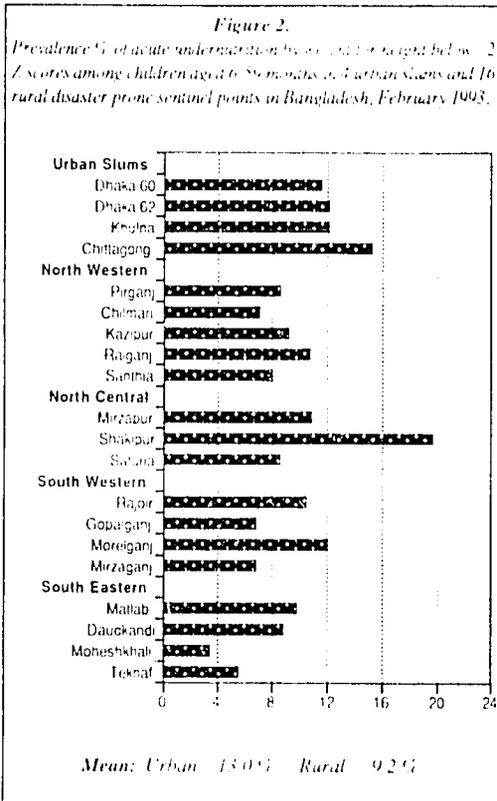
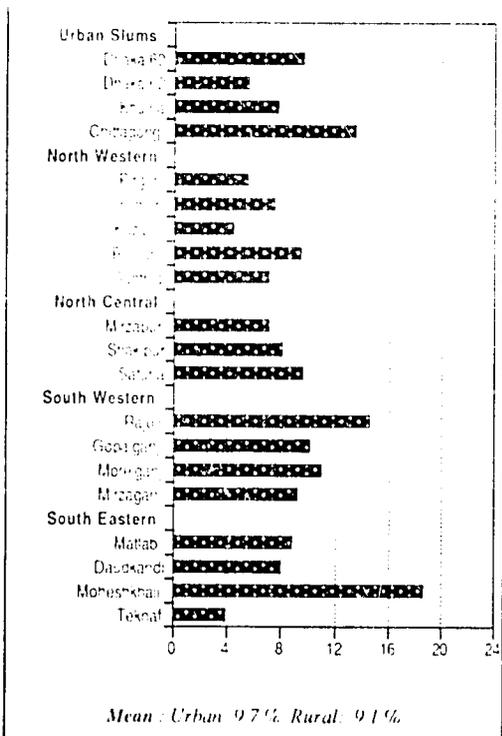
# Nutritional Surveillance for Disaster Preparedness and Prevention of Nutritional Blindness

## Report of February 1993 data collection

In the February 1993 round of NSP, nutritional and health data were collected on 8,910 children aged 6 to 59 months and 6,595 households were interviewed regarding socioeconomic and distress factors.

In previous years of NSP it was observed that the nutritional status of children is best in the months following the Aman harvest in November, with the NSP rounds of December and February generally showing relatively low rates of acute undernutrition. Following a year of good harvest outputs -both the Boro (June) and the Aman harvest had high yields- it could be expected that

**Figure 1.**  
*Prevalence % of undernutrition by MUAC <math>128\text{mm}</math> among children aged 6-59 months in 4 urban slums and 16 rural disaster prone sentinel points in Bangladesh, February, 1993*



the February 1993 nutrition data would compare favourably to data of previous years.

The urban slums demonstrated a decline in undernutrition by MUAC from 13.2% in December 1992 to 9.7% in February 1993 (Figure 1). Acute undernutrition by Weight For height (WFH) below -2 Z scores remained more or less stable at 13% (Figure 2). Rates of chronic undernutrition were at 74.5% (Height For Age <math><-2</math> Z scores) somewhat lower than observed in December 1992. However, although there has been an improvement in nutritional status compared to December 1992, comparison to February data collected in previous years shows little difference, and acute undernutrition by WFH is even somewhat higher.

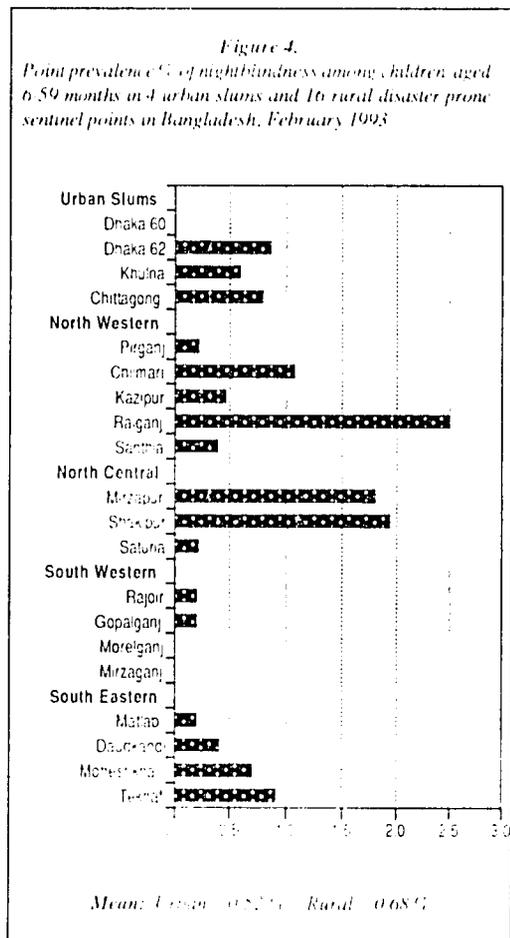
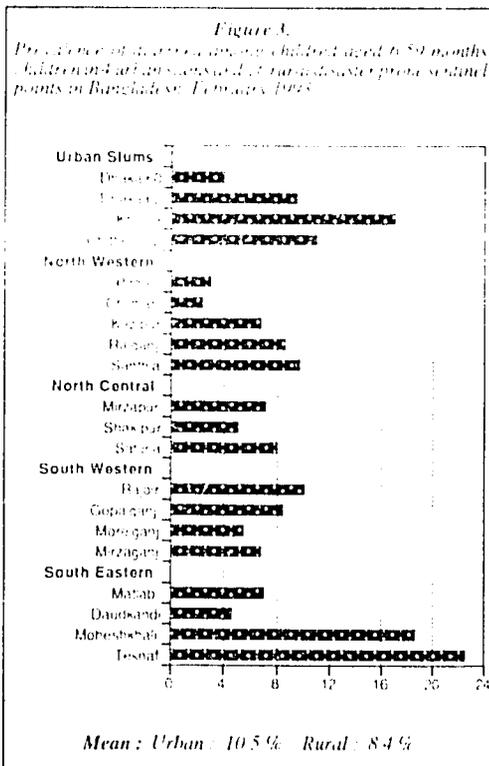
In the rural areas rates of both acute and chronic undernutrition remained stable compared to December 1992. Undernutrition by MUAC was 9.1%, which is slightly lower than in February 1992 but at the same level as in February 1991. Acute undernutrition by WFH below -2 Z scores

was 9.2%, which is slightly lower than in previous years.

As has been extensively reported in the press and confirmed by ICDDR,B, many districts of Bangladesh have been affected over the past few months by an epidemic of severe watery diarrhoea with rapid dehydration. However NSP data show relatively low prevalences of diarrhoea that are similar (urban slums) or slightly lower (rural areas) than in December 1992 (Figure 3). This seeming contradiction might be explained by the fact that the present epidemic seems to affect a proportionally large number of adults and relatively few children.

The prevalence of night blindness, found to be extremely high in December 1992, had decreased substantially in February (Figure 4). The highest prevalences are still observed in Raiganj, Mirzapur and Shakipur, the latter two having a low coverage of vitamin A capsule distribution.

Both urban and rural socioeconomic data show little changes compared to December 1992. Sala-



ries are at a relatively high level and distress at the household level, as indicated by distress sale or food loss. The price of rice is still at a very low level in the rural areas, especially in the Northwestern region. The price of lentils dropped in most sentinel points, again most remarkable in the Northwest.

Summarizing it can be said that rates of undernutrition showed the usual trend of relatively low levels in February 1993. Comparing the February 1993 results with data collected in February 1992 and 1991, it seems however that the good 1992 harvests have not resulted in an improvement in the nutritional status of underfives. Socioeconomic data are indicative of the relatively favourable post-harvest season, with little distress at the household level, relatively high salaries and generally low food prices.





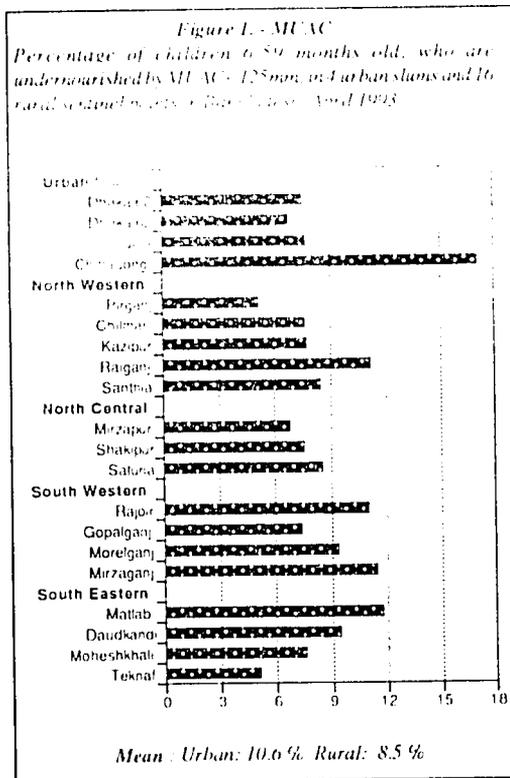
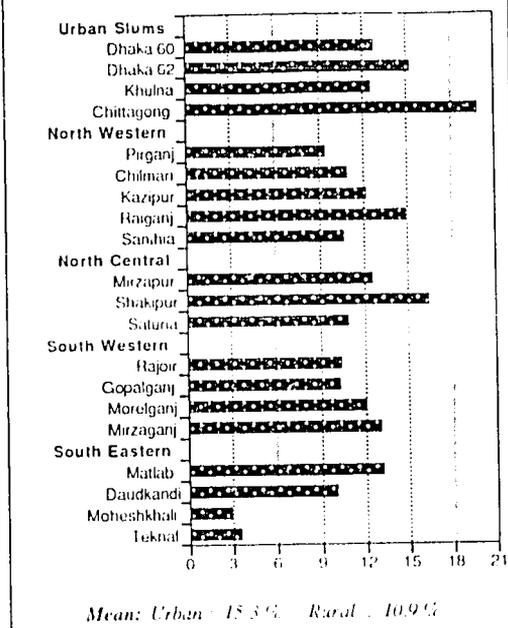
# Nutritional Surveillance for Disaster Preparedness and Prevention of Nutritional Blindness

## Report of April 1993 data collection

In the 19th round of the NSP in April 1993, data was collected on the nutritional and health status of 8,776 children and 6,517 households were interviewed regarding socioeconomic status and distress factors. Data was collected from 20 sentinel sites.

April is the time of wheat harvest in some parts of the country and the Boro rice crop is at the growing stage, prior to harvest in May/June. Since the NSP began in 1990, April has been identified as a time of increased levels of wasting, being intermediate between the best time in the December/February dry season, and the worst time in the mid year monsoon season. In the past two years, rice prices increased between February and April, wheat prices fell and wages remained relatively stable. Diarrhea prevalence increased in April in both the previous years.

**Figure 2. - WASTING**  
Percentage of children 6-59 months old, who are undernourished by Wasting <math>Z</math>-Scores, in 4 urban slums and 16 rural sentinel points in Bangladesh, April 1993



When compared with February 1993, April showed a higher prevalence of undernutrition by wasting in three quarters of the sentinel points. Prevalence of undernutrition by MUAC was slightly higher in the total urban area and slightly lower in the total rural area compared with February. Stunting has a different seasonal pattern, and April 1993 showed some improvement in stunting following the pattern of previous years.

Undernutrition was generally more prevalent in the urban area compared with the rural area: mean urban undernutrition was 10.6% by MUAC, 15.3% by wasting and 70.4% by stunting, while mean rural levels were 8.5%, 10.9% and 66.9% respectively (figs 1,2 and 3). Very high levels of undernutrition were found in a number of sentinel points and Chittagong slum stands out as the worst affected when assessed by all nutrition indicators.

Compared with April in previous years, the urban area had a level of undernutrition similar to April 1991 and considerably lower than April 1992. The rural area had a lower level of undernutrition compared with both the previous years. The degree of worsening change between February and April was

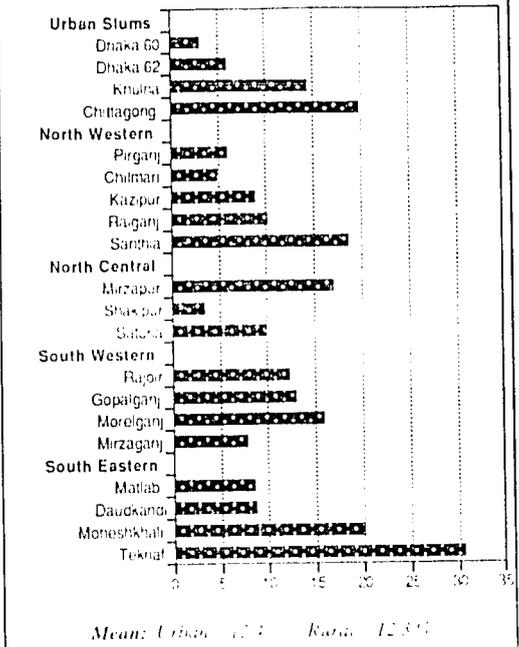
less in 1993 compared with the other two years.

Diarrhea increased in both the rural and urban areas since February 1993 (fig 4). Nightblindness was over 1% in Kazipur, Raiganj, Mirzapur, Shakipur, and Teknaf. VAC distribution in the last 6 months was over 80% in one third of sentinel points, and was better in the urban areas.

Crop loss and distress sales were generally low. Food loans were low in most areas but were over 25% in Moheshkhali, Teknaf, Morelganj and Mirzaganj. Wages of casual workers remained about the same as in February. Between December 1992 and April 1993, rice maintained a very low price in the NSP areas, being cheaper than at any other time since 1990. In most areas wheat prices were less compared with February 1993; wheat was especially cheap in the North Central region and parts of the North West region. Lentils also continued to show a downward price over the past 6 months.

Seasonality of nutritional status has been identified in the NSP areas over the past three years. As expected, wasting was more prevalent in April 1993 compared with February 1993, and stunting was less

**Figure 4. DIARRHEA**  
Percentage of children 6-59 months old who have diarrhea, in 4 urban slums and 16 rural sentinel points in Bangladesh, April 1993.



prevalent. While undernutrition remains at a very high level, there are signs of improvement as the prevalence of undernutrition is generally lower than April levels in previous years. This may be a reflection of market prices of rice which have remained at a low level since the start of 1993.

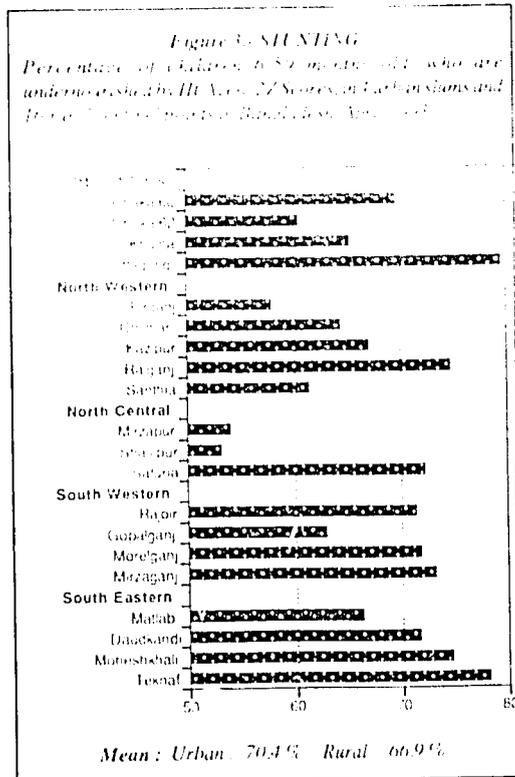
Notes:

**MUAC** The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of MUAC < 12.5mm"

**Wasting** The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of WUIt < 2 Z scores"

**Stunting** The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of HUAge < 2 Z scores"

**Z scores** A method of comparing a child's nutritional status with normal, well-fed children using the internationally accepted NCHS reference tables. Undernutrition is defined as a Z score less than -2.







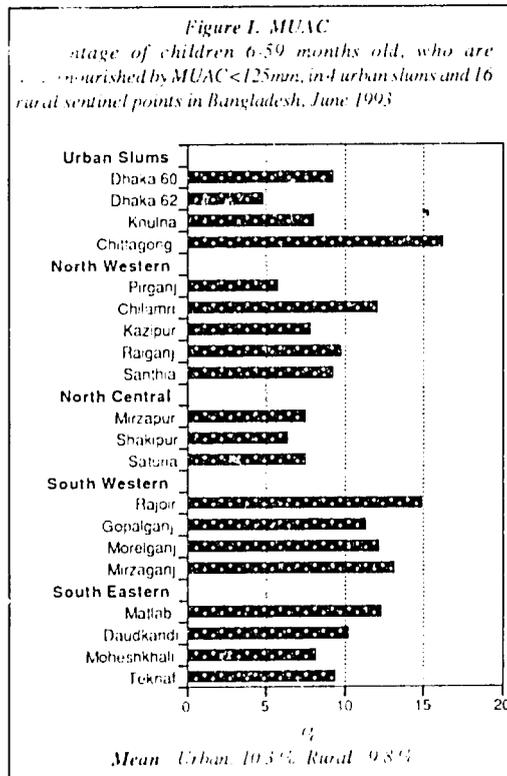
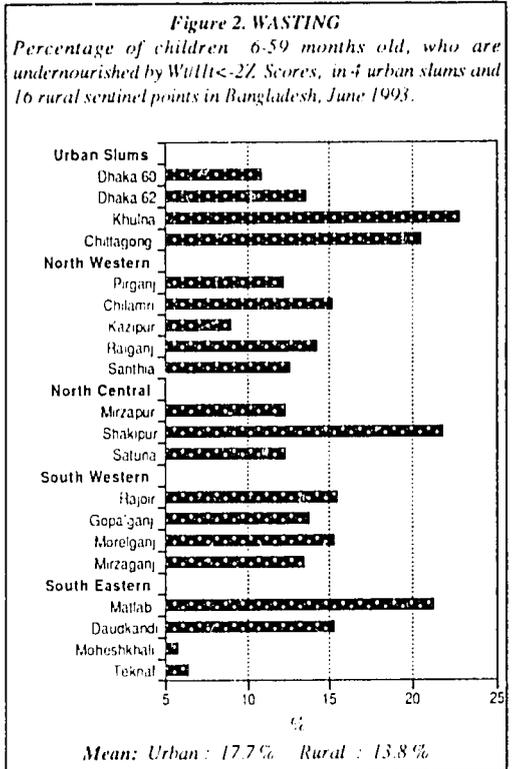
# Nutritional Surveillance for Disaster Preparedness and Prevention of Nutritional Blindness

## Report of June 1993 data collection

In the 20th Round of the NSP in June 1993, nutritional and health data were collected from 8,623 children aged 6-59 months and socio-economic data was collected from 6,353 households.

June is the time of the Boro harvest, a major source of rice in Bangladesh, and rice prices generally show a slight drop at this time. However, despite the harvest, the NSP results from 1990 to 1992 have shown a seasonal pattern of high levels of undernutrition in June, by MUAC and wasting. Stunting has shown a different seasonal pattern, and has generally been slightly better in the mid-year period compared with the dry season in December/February. In 1993, the Boro harvest is estimated to be less than the bumper harvest of 1992 due to some land being used for wheat, and less optimal climatic conditions. (1)

As usual, the urban slum nutritional status was worse



than in the rural areas. Mean urban wasting was 17.7%, MUAC was 10.3% and stunting was 70.7%. Mean rural levels were 13.8%, 9.8% and 64.7% respectively (figures 1, 2 & 3).

Compared with April 1993, the June results showed a higher prevalence of undernutrition by wasting and MUAC in the majority of the sentinel points. This is consistent with the seasonal pattern shown in previous years. Stunting was slightly less in 3/4 of the rural thanas, but was unchanged or higher in the urban slums.

Compared with June in the last three years however, the nutritional status of children was better in June 1993 in most of the NSP areas. All the nutritional indicators (MUAC, Wasting, Stunting) showed that the overall situation was better in June this year. While the levels of undernutrition are still very high, both rural and urban areas have shown a definite trend towards an improved nutritional status throughout 1993.

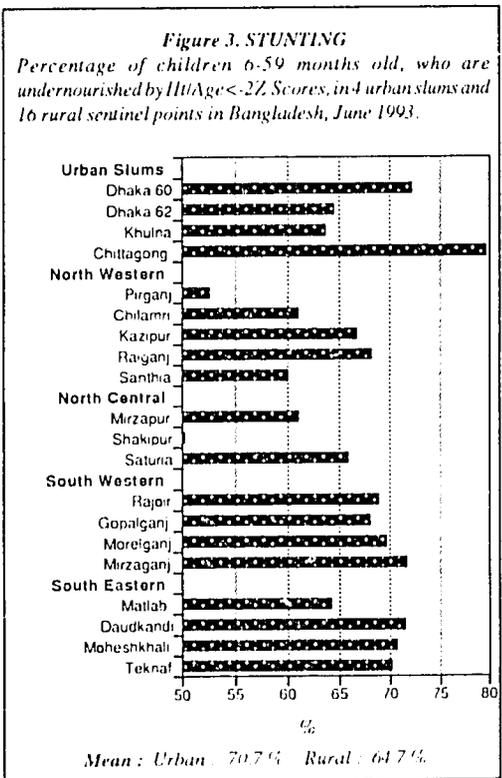
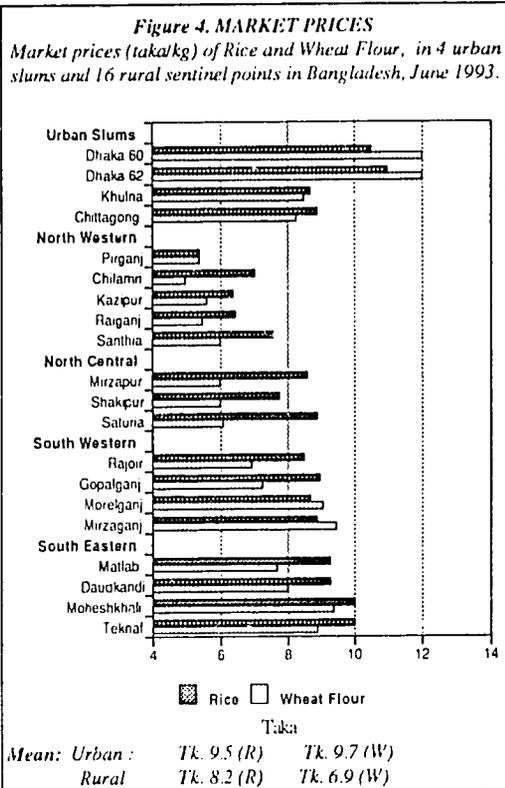
Diarrhea prevalence has generally shown highest levels in April in the NSP rural areas, and in December in the NSP urban slums. In 1992/1993 the peak prevalence at these times was less than in previous

years in both the rural and urban areas. In June 1993 the rural level of diarrhea (12.2%) is similar to June 1990 & 1991 but less than June last year. The urban June level (14.7%) is higher than June levels in the last three years. While some parts of Bangladesh have experienced a cholera epidemic (2), this has not been reflected in the point prevalence of diarrhea in young children in the NSP areas.

Nightblindness was over 1% in Kazipur, Raigonj, Shakipur and Matlab-Extension. Mean vitamin A capsule coverage in the last 6 months was 51.1% in the rural area and 90.4% in the urban slums.

The market prices of rice and wheat in June were extremely low, being even less than in April 1993 in two thirds of the sentinel points (fig. 4). The price of lentils remained about the same as in April. The wages of rural casual workers fell somewhat in June while urban casual wages remained stable. Crop loss and distress sales were very low, and food loans were reported in only 10% of the NSP households, which is half the level reported in June 1992.

Since early 1993, there has been a trend showing improvement in the nutritional status of young chil-



dren when compared with the baseline data of previous years. This trend continued in June 1993, with nutritional status generally being better than in June of the last 3 years. The market price of rice and wheat have remained at very low levels during this period, and indicators of distress have shown minimal levels compared with previous years. It is worth noting however, that despite the improvement compared with previous years, the overall prevalence of wasting in June is still classed as "critical" in the urban slums and as "serious" in the rural areas.

- (1) USAID crop outlook report
- (2) ICDDR,B Glimpse Newsletter, March-April 1993.

**Notes:**

**MUAC:** The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of MUAC <125mm"

**Wasting:** The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of  $W/Ht < -2Z$  scores"

**Stunting:** The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of  $H/W_{Age} < -2Z$  scores"

**Z-scores:** A method of comparing a child's nutritional status with normal, well-fed children using the internationally accepted NCHS reference tables. Undernutrition is defined as a Z-score less than -2.

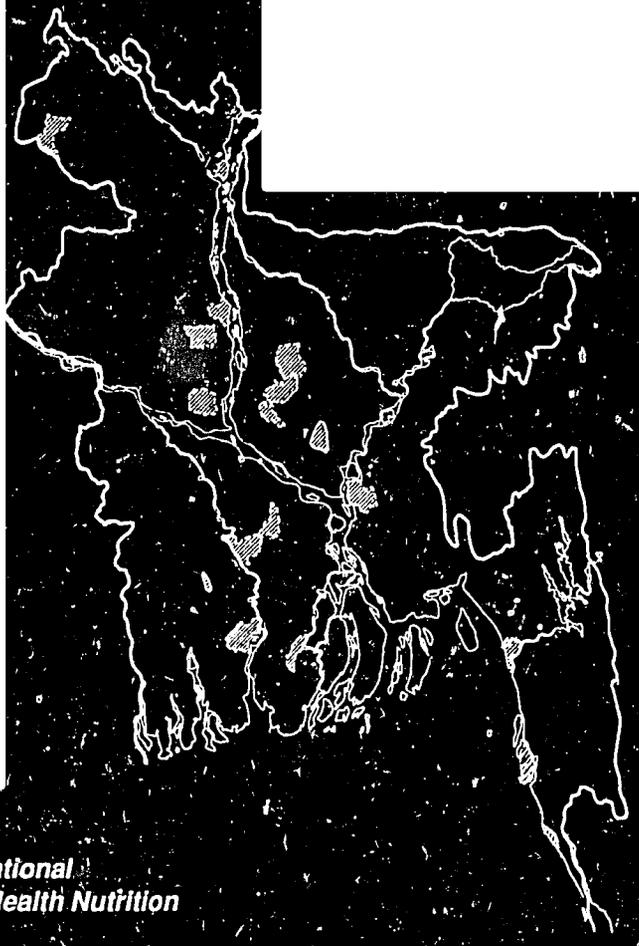


# Nutritional Surveillance

for Disaster Preparedness and Prevention of Nutritional Blindness

Report of Round 21

August 1993 Data Collection



**HKI/IPHN**

*Helen Keller International  
Institute of Public Health Nutrition  
Dhaka, Bangladesh*

*Place this report in the pocket at the back of the NSP Handbook*

# Nutritional Surveillance for Disaster Preparedness and Prevention of Nutritional Blindness

## Report of August 1993 data collection

In the 21st Round of the NSP in August 1993, nutritional data was collected from 8,475 children aged 6-59 months and socioeconomic data was collected from 6,269 households.

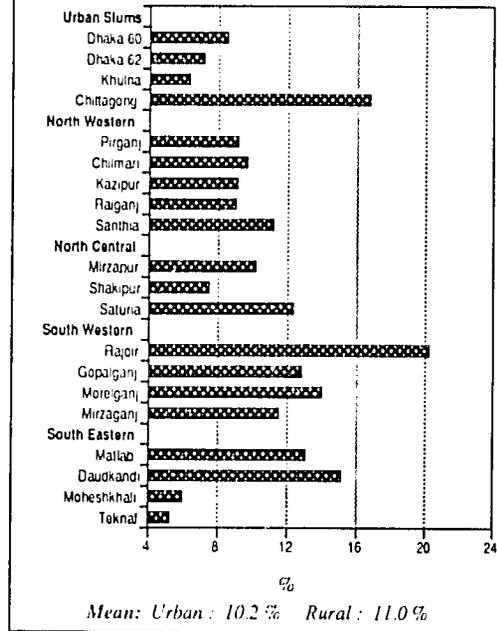
Compared with the 1992 harvest, 1993 output from the Boro crop (April-June) was found to have declined whereas the Aus (July-August) crop was expected to be similar.<sup>(1)</sup> Approximately half the NSP sentinel areas were affected by flood in July/August.

The nutritional status of the 4 urban slums as defined by the anthropometric measurements of MUAC (mid-upper arm circumference), stunting and wasting, was better in August 1993 than in August of the previous years. The status of the 16 rural areas was, for the most part, better also. However, the rural areas showed a greater degree of seasonal worsening of nutritional status than is normally seen between June and August, possibly indicating a return of these areas to their expected higher seasonal prevalence rates. Figure 1 illustrates longitudinal seasonal patterns and trends of undernutrition by weight for age in the 16 rural sentinel points.

Rates of undernutrition by MUAC <125 mm changed little since June in the urban areas. In the rural areas the percentage of MUAC <125 mm slightly increased in August, continuing its expected upward seasonal pattern. Rural MUAC percentages were slightly lower than August figures from the previous three years while urban figures were considerably lower (Figure 2).

Prevalence of stunting increased in both the urban and rural areas. Compared with June, stunting increased in 3/4 of the

**Figure 2. MUAC**  
Percentage of children 6-59 months old, who are undernourished by MUAC <125 mm, in 4 urban slums and 16 rural sentinel points in Bangladesh, August 1993.

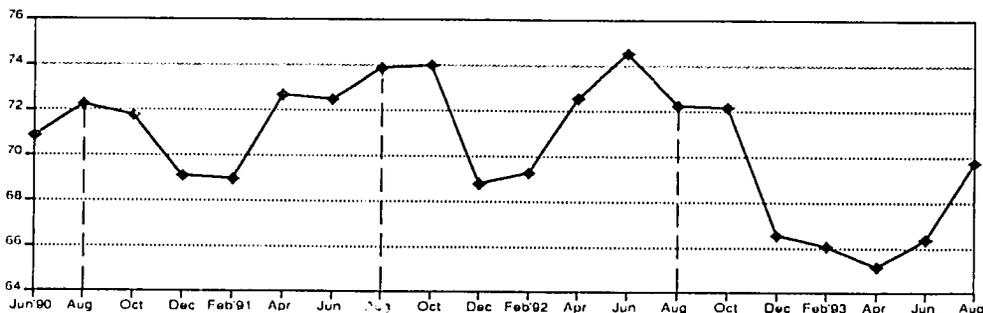


urban sentinel points and 1/2 the rural sentinel points. However, most of the sentinel points show lower rates when compared with those found in August of the 1992 and 1991. Figure 3 shows the areas of highest undernutrition by stunting.

Prevalence of wasting increased in the rural areas and decreased slightly in the urban areas. Although the prevalence of wasting was at a comparatively lower level for August, this should be interpreted carefully as eleven out of the twenty sentinel points exceeded a 15% prevalence and five sentinel points exceeded a 10% prevalence.

**Figure 1. UNDERWEIGHT**

Percentage of children 6-59 months old, who are undernourished by Wt/Age <.27. Scores in 16 rural sentinel points in Bangladesh, June 1990-August 1993.



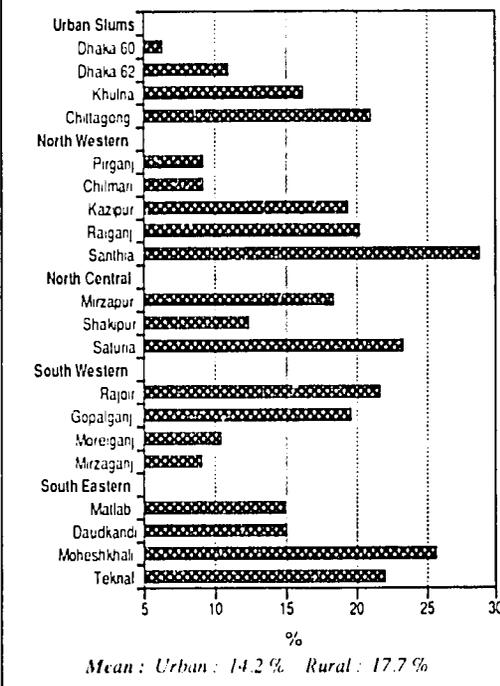
Health indicators in the urban areas changed little since June. The point prevalence of diarrhoea in the urban areas was 14.2%. There was a considerable increase in the point prevalence of diarrhoea in the rural areas to a mean of 17.7% with Moheshkhali and Santhia higher than 25% (Figure 4).

In the urban areas vitamin A capsule distribution continues to be high with 92% of children receiving VAC in the last 6 months and relatively no night blindness. Rural coverage rates with VAC in the last six months were 54%. Night blindness rates exceeding 1% were found in Pirganj, Raiganj, Chilmari, Kazipur and Teknaf.

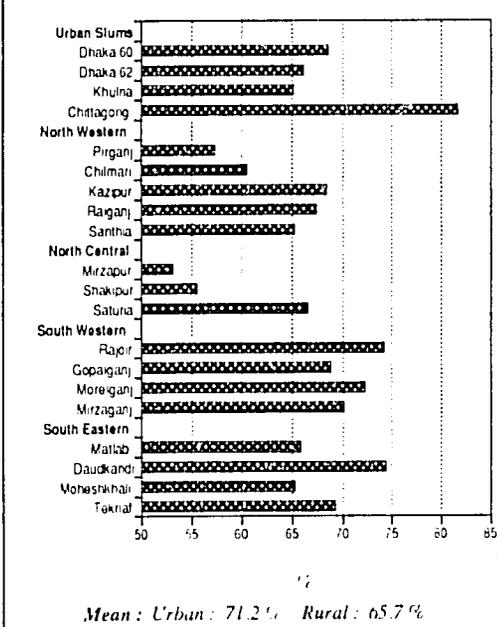
Socioeconomic indicators showed some minor changes compared with June. The percentage of households with distress sales went slightly up in the rural areas and down in the urban areas. There was a small increase in the percentage of food loans in both areas while salaries in the rural areas went down and stayed relatively the same in the urban areas. Both distress sales and food loans in the rural areas were well below last August's findings.

Food prices for rice and flour remained unseasonably low in all the sentinel points. Rice prices went down slightly in the urban areas and up slightly in the rural areas. Wheat prices remained constant in the urban areas and increased in the rural areas.

**Figure 4. DIARRHOEA**  
Point prevalence of diarrhoea in 4 urban slums and 16 rural sentinel points in Bangladesh, August 1993.



**Figure 3. STUNTING**  
Percentage of children 6-59 months old, who are undernourished by  $HUAge < -2Z$  Scores, in 4 urban slums and 16 rural sentinel points in Bangladesh, August 1993.



Although general nutritional status looks better this August than in August of the previous three years these favorable results should be noted with caution. Rural areas are possibly returning to the seasonally worse nutritional status found in the mid-year rainy season of previous years. Rates of stunting are still high which have serious implications as children who are stunted are at a higher risk for morbidity and mortality.

(1) USAID Crop Outlook Report, July 13, 1993

Notes: The following terms refer to children 6-59 months of age.

**MUAC:** The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of MUAC < 12.5mm"

**Wasting:** The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $WUHU < -2Z$  scores"

**Stunting:** The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $HUAge < -2Z$  scores"

**Undernutrition:** The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $WUHU < -2Z$  scores"

**Z scores:** A method of comparing a child's nutritional status with normal, well fed children using the internationally accepted NCHS reference tables. Undernutrition is defined as a Z score less than -2.

## Collaborating Organizations

Aga Khan Community Health Project	(AKCHR)
Bangladesh Rural Advancement Committee	(BRAC)
Bangladesh Red Crescent Society	(BDRCS)
CONCERN	
Gono Unnayan Prochesta	(GUP)
International Center for Diarrhoeal Disease Research, Bangladesh	(ICDDR,B)
PROSHIKA	
Rangpur Dinajpur Rural Services	(RDRS)
United Nations Children's Fund	(UNICEF)

For information and correspondence  
contact:

Dr. Martin W. Bloem, Country Director  
Helen Keller International Bangladesh  
P.O. Box 6066 Gulshan  
Dhaka - 1212, Bangladesh

Telephone: 880-2-324048  
880-2-814234  
880-2-314408  
880-2-816156

Fax: 880-2-813310

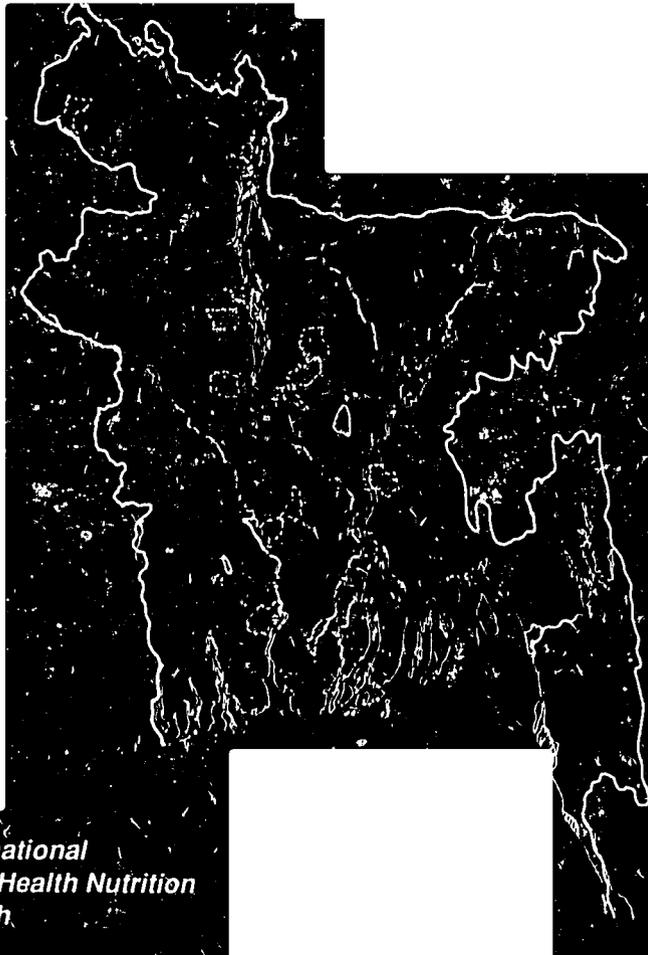
This project is funded by the United States Agency for International Development

# Nutritional Surveillance

for Disaster Preparedness and Prevention of Nutritional Blindness

Report of Round 22

October 1993 Data Collection



*Helen Keller International  
Institute of Public Health Nutrition  
Dhaka, Bangladesh*

*Place this report in the pocket at the back of the NSP Handbook*

# Nutritional Surveillance for Disaster Preparedness and Prevention of Nutritional Blindness

## Report of October 1993 data collection

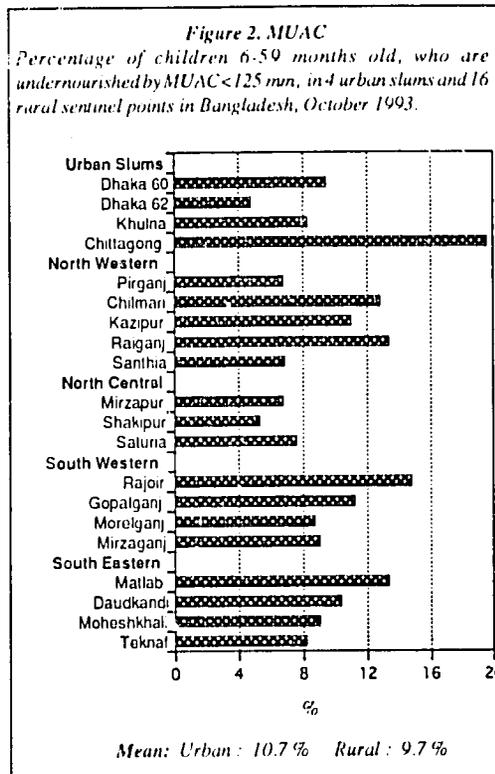
In the 22nd round of the NSP in October 1993, nutritional and health data was collected from 9,227 children aged 6-59 months and socio-economic data was collected from 7,045 households.

The trend towards improved nutritional status continued in October 1993. By all the four nutritional indicators (wasting, stunting, MUAC, and underweight), October's findings were below the rates found in any October since the NSP started.

This trend towards improved nutritional status was especially dramatic by stunting and underweight in both the urban and rural areas. (See Figure 1). Although the seasonal pattern seems to be continuing, the level of worsening at mid-year is at a much lower level than found in previous years. The general improved situation in 1993 corresponds with the fall in the price of rice which has continued to remain low throughout the year.

Rates of undernutrition by MUAC <125 mm decreased in 2/3 of the rural areas. The situation remained mixed in the four urban sentinel points with 3/4 of the sentinel points showing increases. Chittagong slums continue to display alarming rates of undernutrition by MUAC with almost 20% of children falling into this category (Figure 2).

The prevalence of stunting decreased overall in both the rural and urban areas. Even with the overall improvement, rates of stunting remained unacceptably



high. In Chittagong, Kazipur, and Rajoir over 70% of the children examined were defined as stunted; in a majority of the other sentinel points between 50-60% of the children were stunted.

The level of underweight also decreased in both the rural and urban areas. The decrease was sharp and unseasonably early in the urban areas. The slight decrease in the rural areas seems to follow the general pattern that occurs between August and October. For both the rural and urban areas, the rate of undernutrition was considerably lower than in any previous October.

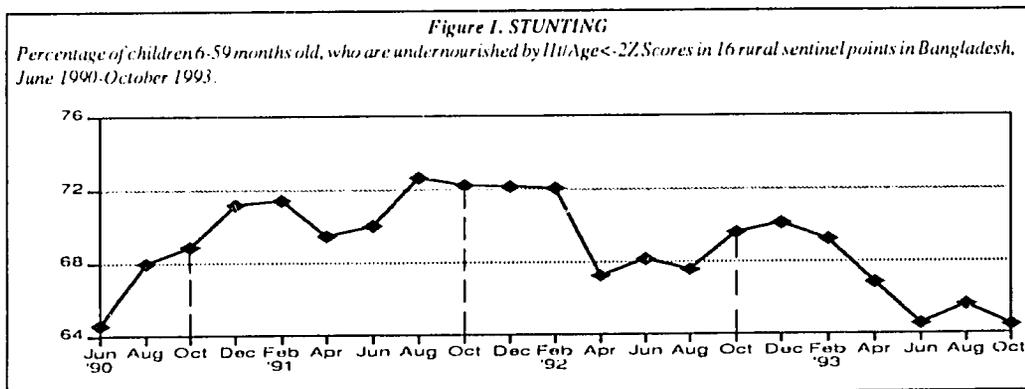


Figure 3 illustrates longitudinal seasonal patterns and trends of undernutrition by weight for age in the 16 rural sentinel points.

Diarrhea in the rural areas remained relatively constant with little change. Overall, 15.5% of the children surveyed had diarrhea with children in the thana of Rajoire exhibiting a prevalence rate of 20.5%. Of those rural children with diarrhea, over 25% of them had it for over 7 days. Diarrhea prevalence decreased somewhat in the urban areas to 12.5%. Diarrhea lasted for over 7 days in 15.4% of urban children.

The percentage of children having received a capsule of vitamin A within the last 6 months dropped from 53% to 43% in the rural areas. A majority of the rural thanas have less than 50% VAC coverage. The urban areas continue to reflect high VAC coverage rates with 93.2% of children having received VAC capsules within the last 6 months. Rates of nightblindness in the 20 sentinel points are shown in Figure 4.

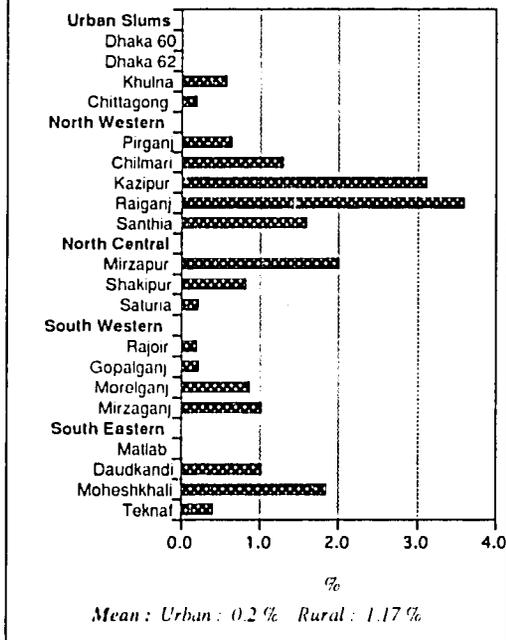
Rice prices increased in both the rural and urban areas but remained unseasonably low. Wheat prices went down very slightly in the urban areas and increased in the rural areas.

Overall, nutritional status appears to be better this October than in any October in the last three years. Seasonal nutritional patterns are occurring as expected but with lower prevalences than in the past three years. While there was a lessening of the severity of malnutrition, rates of undernutrition, stunting, wasting and MUAC are still high by any standard.

Notes: The following terms refer to children 6-59 months of age.

MUAC: The term is used in the text as shorthand to mean "the

**Figure 4. NIGHTBLINDNESS**  
Point prevalence % of nightblindness among children aged 6-59 months, in 4 urban slums and 16 rural sentinel points in Bangladesh, October 1993.



level of undernutrition assessed by the prevalence of MUAC <125 mm"

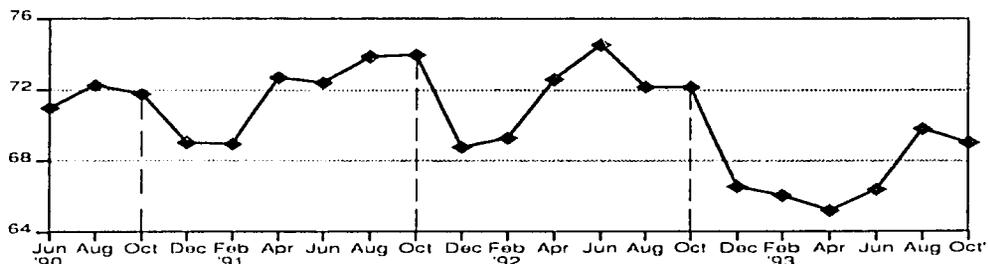
Stunting: The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of Ht/Age <-2 Z scores"

Undernutrition: The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of Wt/Age <-2 Z scores"

Z scores: A method of comparing a child's nutritional status with normal, well fed children using the internationally accepted NCHS reference tables. Undernutrition is defined as a Z score less than -2.

**Figure 3. UNDERWEIGHT**

Percentage of children 6-59 months old, who are undernourished by Wt/Age <-2Z Scores in 16 rural sentinel points in Bangladesh, June 1990-October 1993.



## Collaborating Organizations

Aga Khan Community Health Project	(AKCHP)
Bangladesh Rural Advancement Committee	(BRAC)
CONCERN	
Gono Unnayan Prochesta	(GUP)
International Center for Diarrhoeal Disease Research, Bangladesh	(ICDDR,B)
Institute of Public Health Nutrition	(IPHN)
PROSHIKA	
Rangpur Dinajpur Rural Services	(RDRS)
Society for Health Extension and Development	(SHED) *
United Nations Children's Fund	(UNICEF)

For information and correspondence  
contact:

Dr. Martin W. Bloem, Country Director      Telephone: 880 - 2 - 324048  
Helen Keller International, Bangladesh      880 - 2 - 814234  
P.O. Box 6066 Gulshan                      880 - 2 - 314408  
Dhaka - 1212, Bangladesh                880 - 2 - 816156

Fax: 880 - 2 - 813310

This project is funded by the United States Agency for International Development

# Nutritional Surveillance

for Disaster Preparedness and Prevention of Nutritional Blindness

Report of Round 23

December 1993 Data Collection

## Summary:

Nutritional status in the NSP's 20 sentinel points followed "normal" patterns seen for December. Wasting, MUAC and underweight prevalences went down while stunting increased. The urban areas exhibited the lowest prevalences for all indicators for any December since the NSP started while rural areas seemed to be starting to return to rates considered "usual" for this time of year. High rates of night blindness in certain areas merit earlier distribution of Vitamin A capsules.

HKI/IPHN

Helen Keller International  
Institute of Public Health Nutrition  
Dhaka, Bangladesh

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# Nutritional Surveillance for Disaster Preparedness and Prevention of Nutritional Blindness

## Report of December 1993 data collection

In the 23 round of the NSP in December 1993, nutritional and health data were collected from 9,501 children aged 6-59 months and 7,279 households were interviewed regarding socioeconomic and distress factors.

Data was collected after the Aman harvest which is still the main source of rice in Bangladesh. The 1992 harvest was generally good although the quantity of rice produced was slightly down from last year. As in the previous years, the December data show a drop in the prevalence of undernutrition as measured by wasting, underweight and MUAC <125 mm.

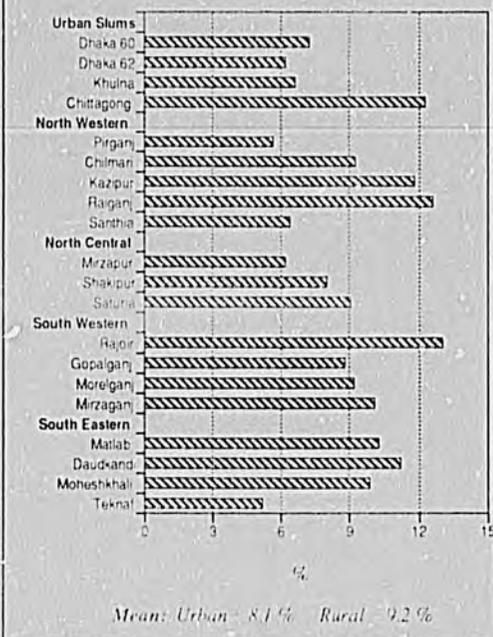
### Rural Bangladesh

Rural rice prices increased slightly from 9.1 taka per kg. to 9.5 taka per kg., continuing their upward trend. At the same time, socioeconomic data showed some increasing distress at the household level. The percentage of families taking a loan for food and making distress sales increased compared with October's findings. Distress sales remained relatively consistent with last December's findings.

Nutritional status improved by most indicators from October to December, following the pattern seen at this time of the year. However, the increase was not as great as can be expected, perhaps signifying the ending of the trend towards improved nutritional status in the rural areas. Many of the indicators returned to rates considered "normal" for this time of year.

The prevalence of acute undernutrition by wasting went down in every rural sentinel point covered by the NSP. Rural rates fell from 16% to 12%. Rates of MUAC <125 mm (Figure 2) and underweight also fell. Stunting increased

**Figure 2. MUAC**  
Percentage of children 6-59 months old, who are undernourished by MUAC <125 mm, in 4 urban slums and 16 rural sentinel points in Bangladesh, December 1993.

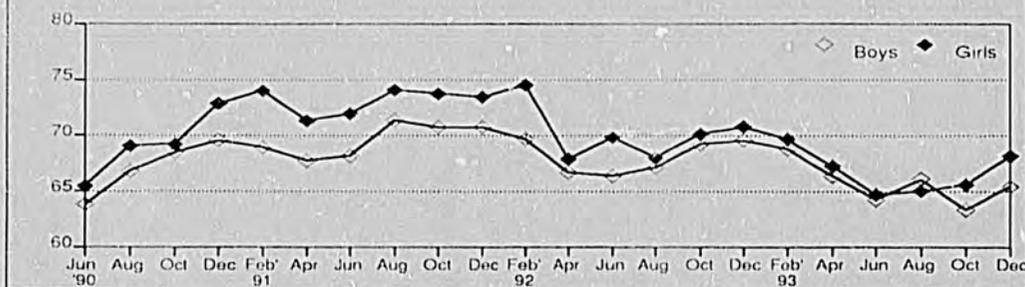


slightly more than usual between October and December but still remains below rates found in any previous December since the NSP started.

Figure 1 and Figure 3 illustrate longitudinal seasonal patterns of underweight and stunting by gender in the rural areas. Girls consistently exhibit worse nutritional status by these two indicators. However, there does seem to be a lessening of the severity of the difference during the period of low rice prices.

The point prevalence of diarrhea decreased in the 16 rural sentinel points to 13.6%. At risk sentinel points, with diarrhea over 15% were Kazipur, Raiganj, Santhia, Mirzapur

**Figure 1. STUNTING**  
Percentage of boys and girls 6-59 months old, who are undernourished by  $HUAge < 2Z$  Scores in 16 rural sentinel points in Bangladesh, June 1990-December 1993.



and Moheshkhali. Nightblindness rates were relatively high in areas of the Northwest (Figure 4). This is because vitamin A capsule distribution had not started in these areas. The high rates found in these areas merit an earlier distribution period.

### Urban Bangladesh

The four urban sentinel points continued to exhibit improved nutritional status. Rice prices decreased from 10.1 to 9.6 taka per kg. Distress indicators were mixed: distress sales at the household level decreased slightly and loans for food went up slightly.

Wasting decreased from October to December, dropping from 16.4% to 9.3%. This is one of the few times when urban rates of undernutrition by wasting fell below rural rates. The prevalence of children undernourished by weight for age dropped to the lowest point since the NSP started. Rates of MUAC <125 mm dropped slightly, decreasing in 3/4 of the sentinel points. Stunting increased, although less than "normal" for this time of year.

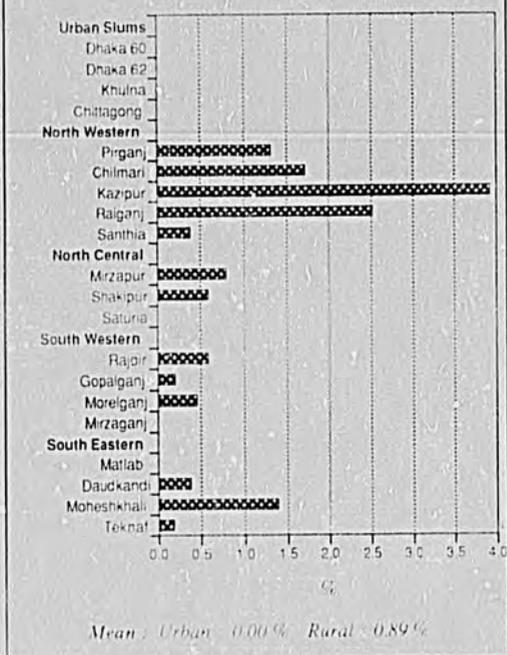
The point prevalence of diarrhea decreased to 12%. The absence of any nightblindness in all four sentinel points reflects the high VAC distribution in these areas.

Overall, nutritional status seems to be following its normal pattern in December with rates of wasting, underweight and MUAC <125 mm decreasing and stunting increasing slightly. The seasonal pattern towards improved nutritional status in the rural areas was less than normal perhaps signifying an end of the trend towards improved status and return to rates of undernutrition considered "normal" for this time of year. While it is obviously positive that urban areas are exhibiting the lowest rates of undernutrition for any December since the NSP started, rate of undernutrition are still high by any standard.

*Notes:* The following terms refer to children 6-59 months of age.

*MUAC:* The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of MUAC <125 mm."

**Figure 4. NIGHTBLINDNESS**  
Point prevalence % of nightblindness among children aged 6-59 months, in 4 urban slums and 16 rural sentinel points in Bangladesh, December 1993.



*Wasting:* The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $Wt/Age < 2Z$  scores."

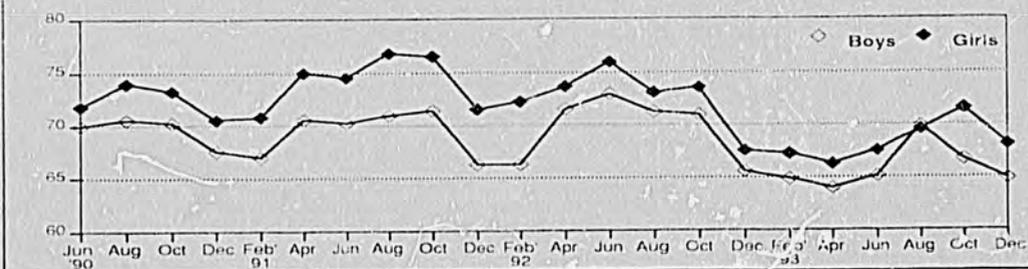
*Stunting:* The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $Ht/Age < 2Z$  scores."

*Undernutrition:* The term is used in the text as shorthand to mean "the level of low nutrition as assessed by the prevalence of  $Wt/Age < 2Z$  scores."

*Z scores:* A method of comparing a child's nutritional status with normal, well fed children using the internationally accepted NCHS reference tables. Undernutrition is defined as a Z score less than -2.

**Figure 3. UNDERWEIGHT**

Percentage of boys and girls 6-59 months old, who are undernourished by  $Wt/Age < 2Z$  Scores in 16 rural sentinel points in Bangladesh, June 1990-December 1993.



Aga Khan Community Health Project	(AKCHP)
Bangladesh Rural Advancement Committee	(BRAC)
CONCERN	
Gono Unnayan Prochesta	(GUP)
International Center for Diarrhoeal Disease Research, Bangladesh	(ICDDR,B)
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Society for Health Extension and Development	(SHED)
United Nations Children's Fund	(UNICEF)
Christian Commission for Development In Bangladesh	(CCDB)

For information and correspondence  
contact:

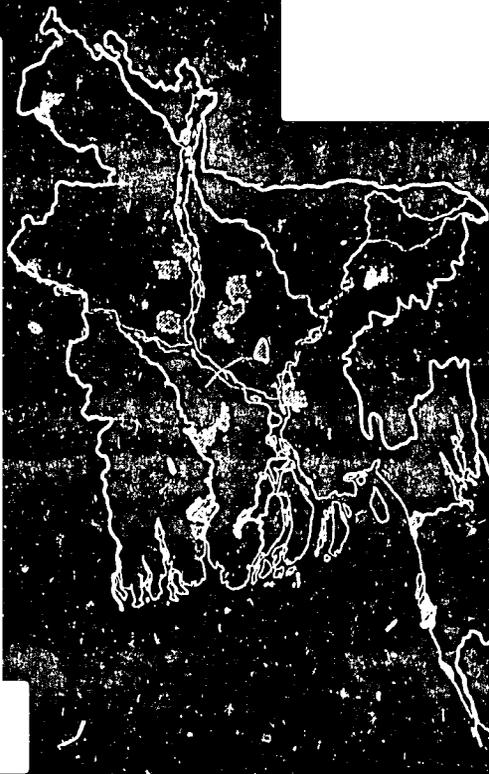
Dr. Martin W. Bloem, Country Director	Telephone: 880-2-814234
Helen Matzger, Project Officer	880-2-816156
Helen Keller International Bangladesh	880-2-314408
P.O. Box 6066 Gulshan	880-2-324048
Dhaka - 1212, Bangladesh	
	Fax: 880-2-813310

This project is funded by the United States Agency for International Development

# Nutritional Surveillance Project

Report of Round 24

February 1994 Data Collection



## **Summary:**

*Nutritional status in the NSP's 20 sentinel points remained relatively consistent with findings from December of 1993. Both December and February's findings reflect the relatively more prosperous post-harvest season. Urban areas continued to exhibit some of the lowest rates of undernutrition found since the NSP started. Rice prices in both rural and urban areas rose sharply signifying an end to the year-long period of lower rice prices.*

# Nutritional Surveillance Project

## Report of February 1994 data collection

In the February 1994 round of NSP, nutritional and health data were collected from 9566 children aged 6-59 months and 7222 households were interviewed regarding socioeconomic and distress factors.

The prevalence of wasting, MUAC, stunting and underweight in both the rural and urban areas remained similar or decreased slightly compared with last months findings. These findings are relatively consistent with NSP findings for February from previous years

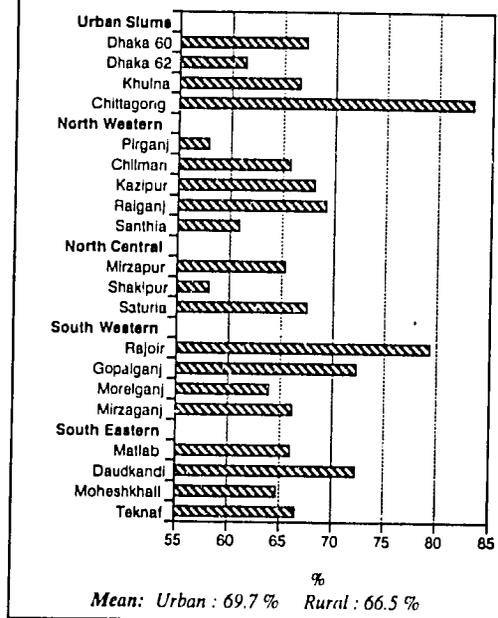
### Rural Bangladesh

Rural rice prices increased considerably from 9.5 taka per kg. to 11.3 taka per kg. This marks the highest price of rice since June of 1992 as well as the largest rise observed since the NSP started. Similarly, the percentage of respondents taking a loan for food increased while distress sales remained relatively constant with December 1993 findings.

Nutritional indicators remained consistent with the patterns seen for this time of the year. As the NSP has found in the previous years, the two months of surveillance following the Aman harvest (December and February) show lower rates of acute and chronic undernutrition than found at other times of the year. This February's findings were no exception.

Both acute and chronic undernutrition remained fairly stable compared with December 1993 with all nutritional indicators declining slightly. Undernutrition by MUAC <125 cm went down to 8.2%. MUAC decreased slightly in half the rural sentinel points and increased slightly in the other half. Wasting prevalences were also down, to 10.6%, although this rate for February is higher than what has been found in the previous two years of the NSP. Stunting fell to 66.5% which is the lowest February rate

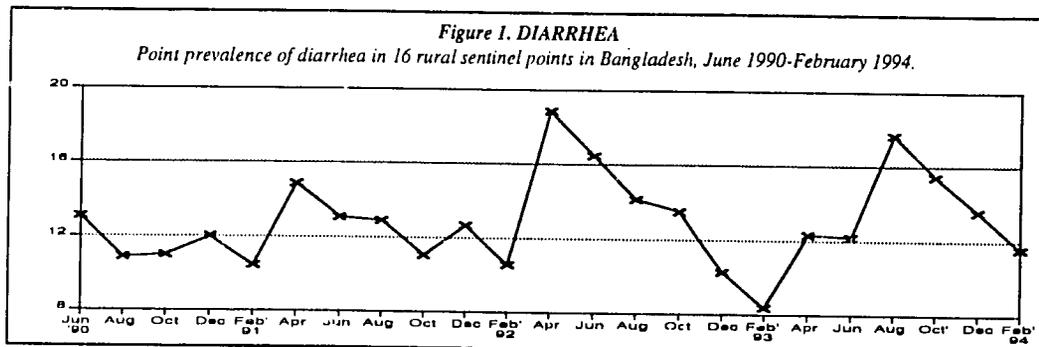
**Figure 2. STUNTING**  
Percentage of boys and girls 6-59 months old, who are undernourished by Ht/Age < -2Z Scores in 4 urban slums and 16 rural sentinel points in Bangladesh, February 1994.



recorded since the NSP started (Figure 2). Stunting rates greater than 70% were found in Rajoir, Gopalganj and Daudkandi. The prevalence of underweight children by thana can be found in Figure 3.

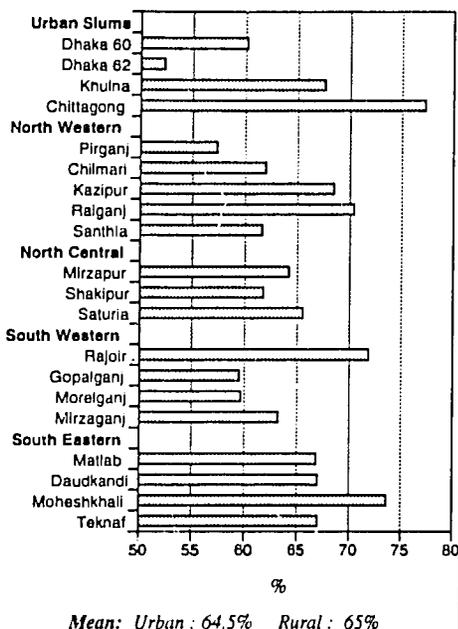
Other health indicators reflected patterns found for this time of the year. February is the time of the year when the NSP finds the lowest point prevalences of diarrhea. This February was no exception with diarrhea down to 11.6%. However, this rate is higher than any other February since the beginning of the NSP. Of particular concern is that of those with diarrhea, 22.2% reported the duration of diarrhea as greater than 7 days. Figure 1 is a longitudinal graph illustrating the point prevalence of diarrhea found in the 16 rural areas.

**Figure 1. DIARRHEA**  
Point prevalence of diarrhea in 16 rural sentinel points in Bangladesh, June 1990-February 1994.



**Figure 3. UNDERWEIGHT**

Percentage of boys and girls 6-59 months old, who are undernourished by  $WU/Age < -2Z$  Scores in 4 urban slums and 16 rural sentinel points in Bangladesh, February 1994.



### Urban Bangladesh

The four urban sentinel points also reported a sharp rise in the price of rice to 11.3 taka per kg. This is the highest price since August of 1992 as well as the steepest rise within a two month period since the NSP started collecting commodity price information. 12% of households reported taking a loan for food and 1.6% of families reported a distress sale. These indicators of distress are relatively consistent with last months findings.

Nutritional status in the urban areas, especially signs of acute undernutrition, stayed relatively constant with last

months findings with slight decreases found in wasting and  $MUAC < 125$  cm. Figure 4 is a longitudinal graph illustrating the seasonal prevalence of acute wasting found in the four urban sentinel points. Stunting in the urban areas hovered at 69.7%. Of particular note is the level of stunting of 83.3% found in the Chittagong slums.

The point prevalence of diarrhea in the urban areas decreased to 11.6%. However, this rate is considerably higher than those found in any other February since the start of the NSP. The point prevalence of diarrhea was over 15% in both Khulna and Chittagong. Nightblindness rates continued to remain very low with over 95% of the children having received vitamin A capsules within the last six months.

Overall, both the rural and urban areas exhibited rates of undernutrition consistent with previous findings after the Aman harvest. Undernutrition in the urban areas continued to remain low compared to any other period since the NSP started. The sharp increase of rice prices in both the rural and urban areas will have to be monitored closely in the coming months to determine the effect this rise will have on nutritional status of children in this country.

Notes: The following terms refer to children 6-59 months of age.

*MUAC:* The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of  $MUAC < 125$  mm"

*Wasting:* The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $WU/Ht < -2$  Z scores"

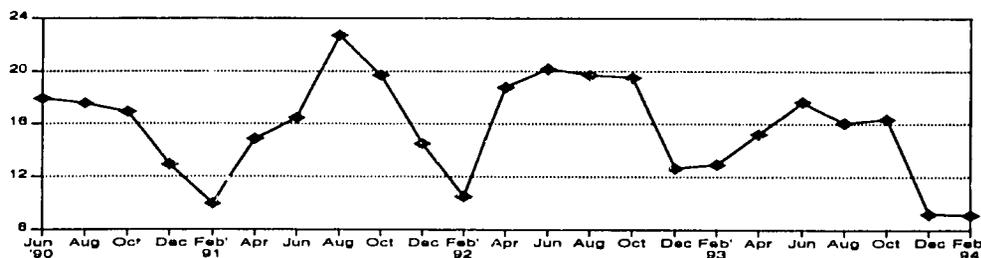
*Stunting:* The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $HU/Age < -2$  Z scores"

*Undernutrition:* The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $WU/ Age < -2$  Z scores"

*Z scores:* A method of comparing a child's nutritional status with normal, well fed children using the internationally accepted NCHS reference tables. Undernutrition is defined as a Z score less than -2.

**Figure 4. WASTING**

Percentage of boys and girls 6-59 months old, who are undernourished by  $WU/Ht < -2Z$  Scores in 4 urban slums in Bangladesh, June 1990 - February 1994.



## Collaborating Organizations

Aga Khan Community Health Project	(AKCHP)
Bangladesh Rural Advancement Committee	(BRAC)
CONCERN	
Gono Unnayan Prochesta	(GUP)
International Center for Diarrhoeal Disease Research, Bangladesh	(ICDDR,B)
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Rangpur Dinajpur Rural Services	(RDRS)
Society for Health Extension and Development	(SHED)
United Nations Children's Fund	(UNICEF)
Christian Commission for Development in Bangladesh	(CCDB)

### For information and correspondence contact:

Mr. Shawn K. Baker, Country Director  
Helen Matzger, Project Officer  
Helen Keller International Bangladesh  
P.O. Box 6066 Gulshan  
Dhaka - 1212, Bangladesh

Telephone: 880 - 2 - 814234  
880 - 2 - 816156  
880 - 2 - 314408  
880 - 2 - 324048

Fax: 880 - 2 - 813310

Dr. Martin W. Bloem, Regional Technical Director  
Helen Keller International, Indonesia  
P. O. Box. 4338, Jakarta  
Indonesia

Tel./Fax: 62 - 21 - 520 - 7297  
Tel: 62 - 21 - 525 - 6364

Telex: 79662074 BINAMULIA  
CABLE: VITAPRE

This project is funded by the United States Agency for International Development



# Nutritional Surveillance Project

## Report of April 1994 data collection

In the April 1994 round of NSP, nutritional and health data were collected from 14,166 children aged 6-59 months and 9,463 households were interviewed regarding socioeconomic and distress factors in 22 rural thanas and 4 urban slums. Six new thanas were added to the surveillance system in this round; Mohanpur, Manda and Fulbari from the northwest, Jhikargacha and Daulatpur from the southwest and Kamalganj from the southeast section of the country.

March/April is the time of the wheat harvest in some parts of the country and the Boro rice crop is still at the growing stage prior to harvest in May/June. Since the NSP began in 1990, April has been identified as a time of increased levels of wasting, being intermediate between the best time in the December/February dry season and the worst time in the mid-year monsoon season.

### Rural Bangladesh

Rural rice prices continued their upward trend reaching 12 taka per kg. The prices of wheat and dal fell slightly. Loans for food and distress sales increased in the rural areas. Figure 1 is a longitudinal graph illustrating the prevalence of food loans found in the rural sentinel points.

The level of distress was reflected in the prevalence of wasting which rose sharply in many of the rural sentinel points. Of the sixteen old thanas nine experienced an increase in the prevalence of wasting. Of particular concern is that 4 of the 22 rural thanas

(Raiganj, Shakipur, Fulbari and Daulatpur) had wasting levels above 19% (Figure 2). Similarly to wasting, rural rates of MUAC <125 mm rose to 9.5% from February's 8.2% and underweight children also increased from 65% in February to 67.9%.

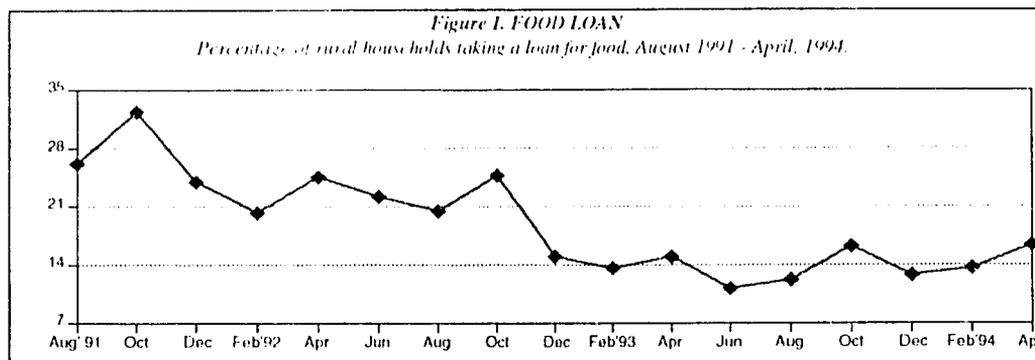
Stunting decreased in nine of the sixteen old sentinel points which is consistent with what has been found in previous years of the NSP between February and April. This April's level of 61.6% is the lowest for any April since the NSP started (Figure 3).

The point prevalence of diarrhea rose from February's rate of 11.6%; 14.1% of children had some form of diarrhea with loose diarrhea being the most frequently reported. Almost 50% of rural children had received a Vitamin A capsule in the last 6 months and .88% children suffered from nightblindness, as reported by mothers.

### Urban Bangladesh

Food loans and distress sales decreased slightly in the urban areas this month. 1.3% of families reported the selling of a household item in distress with the average value of the sale at 1032 takas. 7.2% of reporting households had taken a loan for food. Rice prices rose by a little more than half a taka per kg. from February's prices. The price of other basic food items such as lentils, wheat flour and soyabean oil also rose.

The nutritional status of children in the urban areas displayed patterns typical for the month of April. MUAC <125 mm rose in 3 of the 4 sentinel points. Wasting increased in all urban areas to 7.3%. This rise is somewhat less than what normally occurs during this period in the urban areas. Stunting continued to hover around 69%.

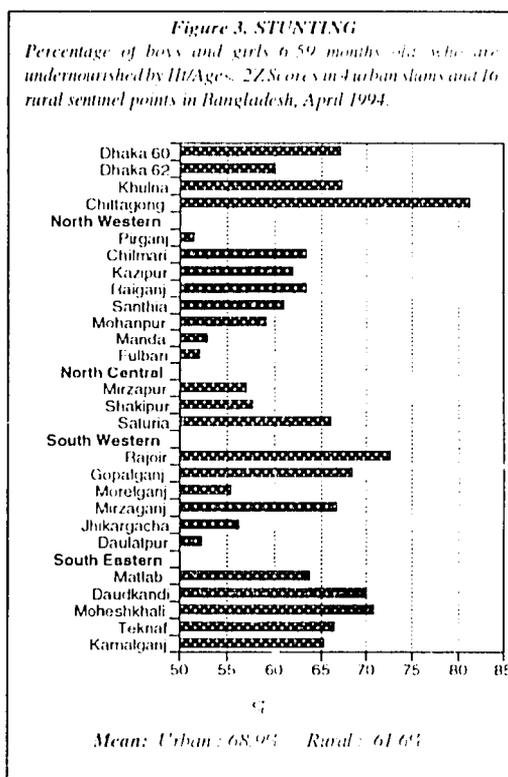
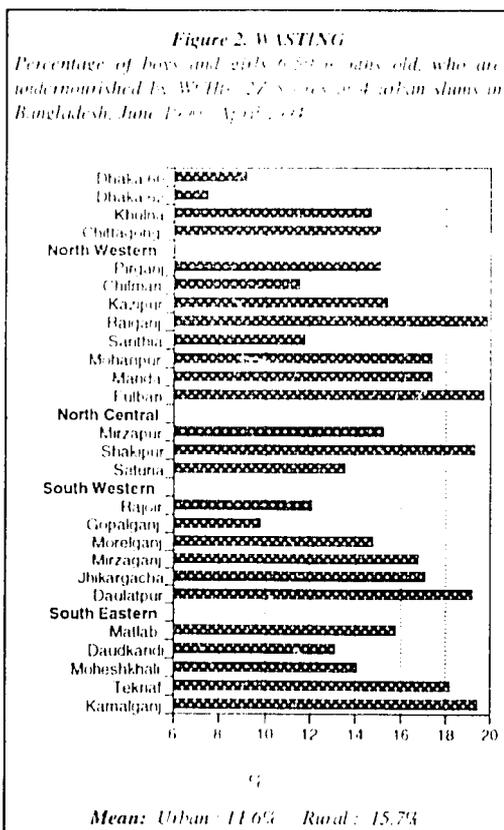


The point prevalence of diarrhea rose from 11.6 to 12.8%. Again, this rise is expected between February and April. Nightblindness rates were very low with almost complete capsule coverage.

In general, wasting, MUAC and underweight prevalences increased in April 1994 from February 1994 in both the rural and urban sentinel points. Overall, levels of stunting decreased. The addition of six new rural areas from underrepresented parts of the country will add strength to the ability of the dataset to represent the whole of Bangladesh.

### Teknaf

April's data collection was taken immediately prior to the May 2nd cyclone which affected the thana of Teknaf. A post cyclone study occurred 2 weeks after the cyclone. Comparing the two showed that diarrhea rose from 11.2% to 26% after the cyclone. MUAC < 125 mm in April was 8.8% and rose to 10.7% post cyclone.



Notes: The following terms refer to children 6-59 months of age.

**MUAC:** The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of Mid Upper Arm Circumference < 125 mm."

**Wasting:** The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of WHZ < 2 Z scores."

**Stunting:** The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of Ht/Age < 2 Z scores."

**Undernutrition:** The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of WHZ < 2 Z scores."

**Z scores:** A method of comparing a child's nutritional status with normal, well fed children using the internationally accepted NCHS reference tables. Undernutrition is defined as a Z score less than -2.





# Nutritional Surveillance Project

## Report of June 1994 data collection

In the June 1994 round of the NSP, nutritional and health data were collected from 11,988 children 6-59 months old and 9,043 households were interviewed regarding socio-economic and distress factors in 22 rural thanas and four urban slums.

June is the time of the Boro harvest, a major source of rice in Bangladesh, and rice prices in the rural areas generally show a small drop during this season. However, levels of wasting, underweight and MUAC < 125 mm tend to be high during June. Stunting shows a different pattern with rates more pronounced during the October/December dry season. This June's results show little exception to what has been found in previous years.

### Rural Bangladesh

Rural rice prices showed their first decline in a year falling from an average of 12 taka per kg, to 11 taka per kg. The price of oil and potatoes rose considerably while dal and flour remained relatively constant with last months findings. Loans for food decreased in almost every sentinel point following the pattern found between April and June.

Wasting continued its seasonal rise to unprecedented levels. 18 of the 22 sentinel points recorded increases in wasting with an overall rate of 18.9% for June. Figure 1 is a longitudinal graph of wasting found in the NSP's rural sentinel points. 8 thanas reported

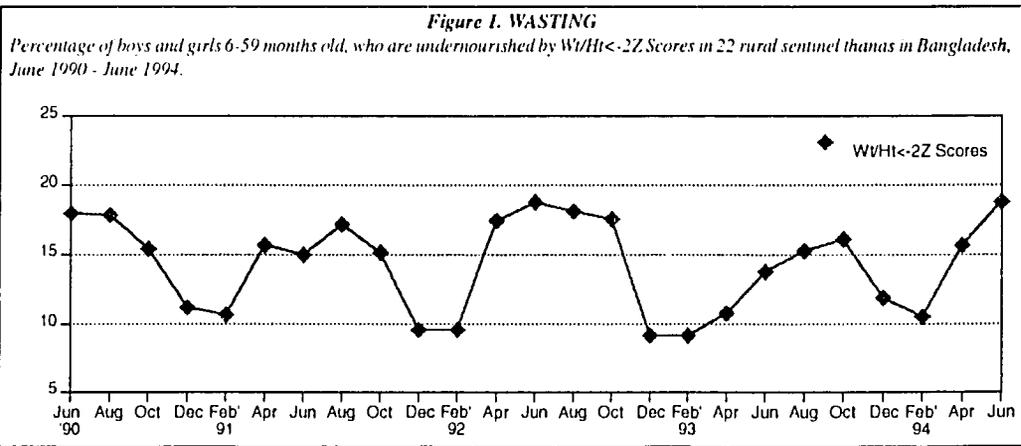
levels of wasting above 20%.

The prevalence of underweight children also increased in 16 of the 22 sentinel points to just above 70%. MUAC < 125 mm rose slightly to 9.6%. This rate of MUAC < 125 mm is similar to what was found last year in June and less than the previous two years. Data on stunting showed that long term malnutrition continues to stay at lower levels than found in earlier rounds of the NSP. The three previous years stunting has increased slightly from April to June; this year there was no increase with this June's rate the lowest for any June since the start of the NSP. Figure 3 shows the level of stunting found in the NSP sentinel points.

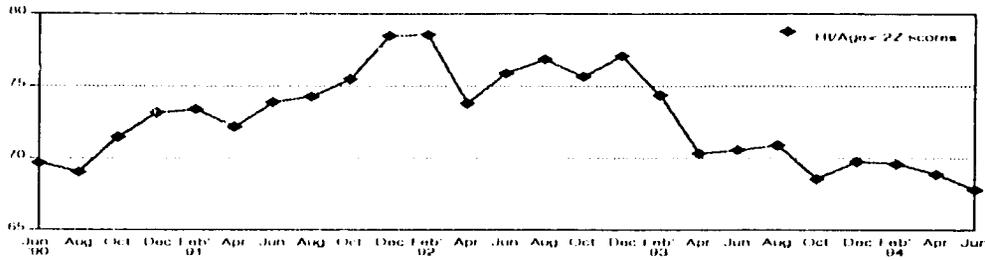
The point prevalence of diarrhea decreased between April and June from 14.1% to 6.1%. This decrease was much more dramatic than what has been seen in earlier rounds for the same time of year. 41% of rural children had received a vitamin A capsule in the last six months which was the lowest coverage recorded by the NSP (1). In children 6-59 months old, .9% of children suffered from night blindness, as reported by their mothers; this number increases to 1.1% when children under two years of age are excluded (2).

### Urban Bangladesh

Urban rice prices, unlike those in the rural areas, rose from an average of 11.9 taka per kg in April to 12.3 taka per kg, in June. The prices of oil, flour and dal also rose as compared to the previous round of data collection. Loans for food increased; 9.4% of the households had taken a loan for food in June compared with 7.2% in April. Distress sales remained constant with 1.4% of respondents reporting a distress sale.



**Figure 2. STUNTING**  
 Percentage of boys and girls 6-59 months old, who are undernourished by  $Ht/Age < -2Z$  Scores in 4 urban slums in Bangladesh, June 1990 - June 1994.



Wasting increased somewhat more than expected between April and June. June is the time of year when wasting is at or near the highest level of the season. This June's rate of 16.1% is lower than what has been found in previous Junes. Undernutrition by  $MUAC < 125$  mm and underweight also increased between April and June.  $MUAC < 125$  mm rose from 7.7% to 10.8% and the prevalence of underweight rose from 67% to 71%. Stunting decreased slightly. Urban stunting rates have remained relatively constant for the last 14 months.

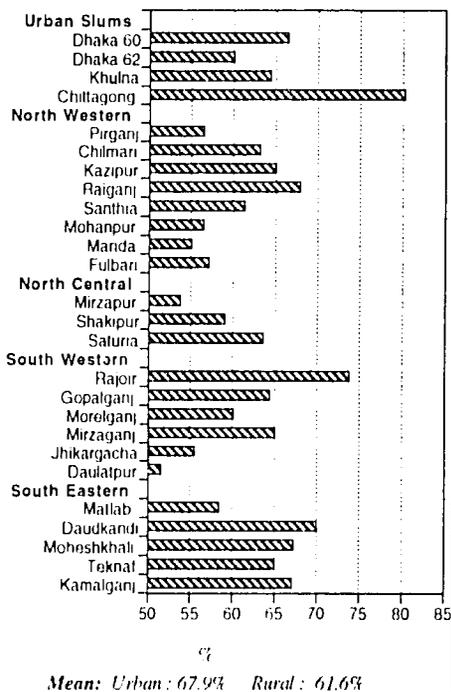
Figure 2 is a longitudinal graph of stunting rates found in the four urban slums in the NSP surveillance system.

The point prevalence of diarrhea decreased slightly in the urban areas from 12.9% to 11% of the children had fevers. No nightblindness was reported in any of the urban slum areas, which is most probably due to the high VAC coverage (93.1%) in those 4 slums which are NGO working areas.

**Teknaf**

Post cyclone monitoring shows that a high level of acute nutritional stress continues in Teknaf. The level of wasting was found to be 33%, the highest ever for Teknaf.

**Figure 3. STUNTING**  
 Percentage of boys and girls 6-59 months old, who are undernourished by  $Ht/Age < -2Z$  Scores in 4 urban slums and 22 rural sentinel thanas in Bangladesh, June 1994



(1) Vitamin A coverage data not available for december 1991 through August 1992 rounds.

(2) See WHO/UNICEF, 1992. *Indicators for Assessing Vitamin A Deficiency and their Application in Monitoring and Evaluating Intervention Programs*. Report on a Joint WHO/UNICEF Consultation. Geneva, Switzerland, Nov. 9-11, 1992.

Notes: The following terms refer to children 6-59 months of age.

*MUAC*: The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of  $MUAC < 125$  mm"

*Wasting*: The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $Wt/Ht < -2 Z$  scores"

*Stunting*: The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $Ht/Age < -2 Z$  scores"

*Underweight*: The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $Wt/Age < -2 Z$  scores"

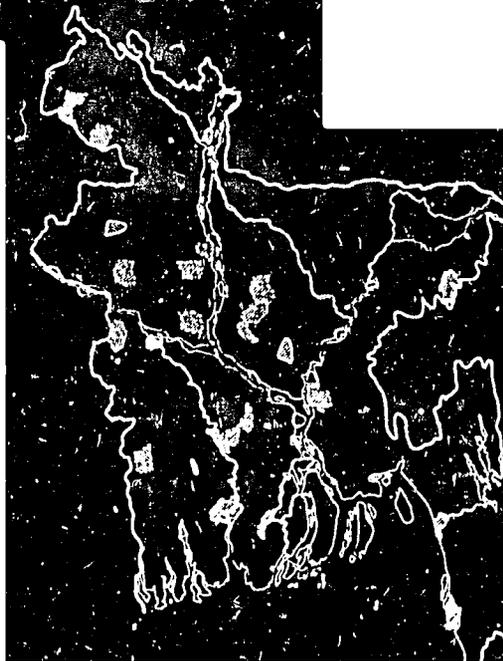
*Zscore*: A method of comparing a child's nutritional status with normal, well fed children using the internationally accepted NCHS reference tables. Undernutrition is defined as a Zscore less than -2.



# Nutritional Surveillance Project

Report of Round 27

August 1994 Data Collection



*Summary: The August 1994 round of data collection showed worsening levels of nutritional status especially in the rural areas of the country: all the rural nutritional indicators displayed increasingly severe levels of malnutrition. Wasting was especially acute with the highest level recorded since the inception of the NSP. The rural areas appear to be returning to levels of malnutrition recorded before the fall in rice prices, whereas the urban areas are showing mixed results, with wasting and underweight prevalences getting worse and stunting and MUAC <125 mm remaining relatively stable. Coverage of vitamin A capsules (VAC) was the lowest ever recorded by the NSP in rural areas, 31.1%.*

**HKI/IPHN**

**Helen Keller International  
Institute of Public Health Nutrition  
Dhaka, Bangladesh**

# Nutritional Surveillance Project

## Report of August 1994 data collection

In the 27th Round of the NSP in August of 1994, nutritional data was collected from 12,019 children 6-59 months and socioeconomic data was collected from 9,036 households. The sample covered 22 rural thanas and 4 urban slums.

Compared with the 1993 harvest, 1994 output from the Boro crop (April-June) was found to have increased slightly whereas the Aus (July - August) crop yield was expected to be higher this year.

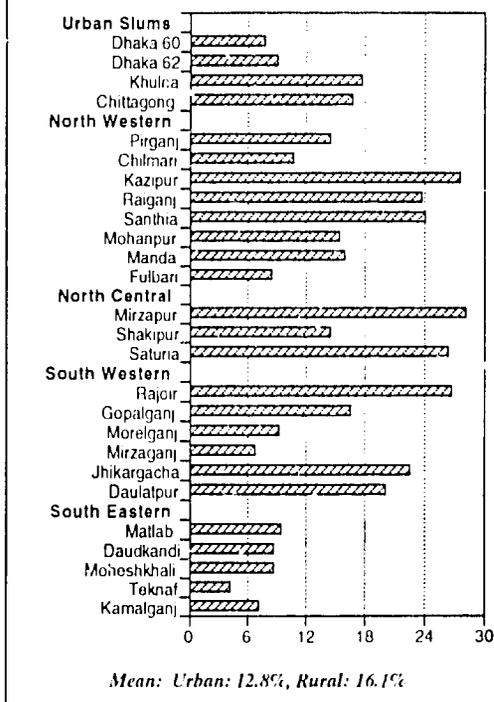
### RURAL BANGLADESH

Although there was a slight decline in rice prices recorded in the last round (June), this month's round showed rice prices continuing their upward trend going from 11 taka to 12 taka per kg. Prices of most essential food items collected by the NSP (flour, dal, potato, oil and beef) all rose between June and August. Loans for food stayed relatively constant with the last round and distress sales declined somewhat.

Nutritional status in the rural areas worsened considerably by all four of the indicators used. A majority of the 22 thanas recorded increases in the levels of wasting, stunting, underweight and undernutrition by MUAC <125 mm. Of particular concern is the overall level of wasting which has reached unprecedented levels. With almost five years of longitudinal data it is known that this season (June-August) is particularly severe (See Figure 1, June 1994 Report) for wasting levels; however, this August's level of 19.9% is the highest ever recorded. The 'normal' seasonal wasting curve is appearing a notch higher than previously recorded levels.

Underweight prevalences rose 2 percentage points to

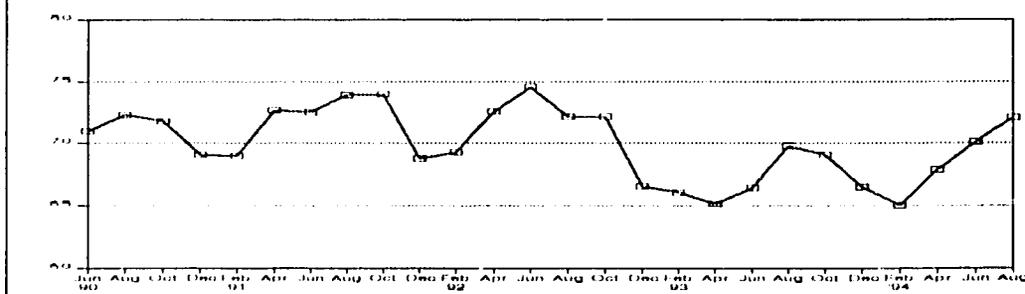
**Figure 2. DIARRHEA**  
Point prevalence of diarrhea among children 6-59 months old, in 4 urban slums and 22 rural sentinel thanas, August 1994.



72.1% (Figure 1). This is the highest rate recorded since October of 1992 and seems to portend a return to levels of underweight recorded before the rice price fall. Stunting increased in 15 of 22 thanas by an overall of a little over 3 percentage points to 64.2%. This amount of rise in stunting between July and August is what has been recorded in previous years. MUAC < 125 mm rose from 9.6 to 11.5%. This is also consistent with previous years' findings.

Other health indicators display increasing distress.

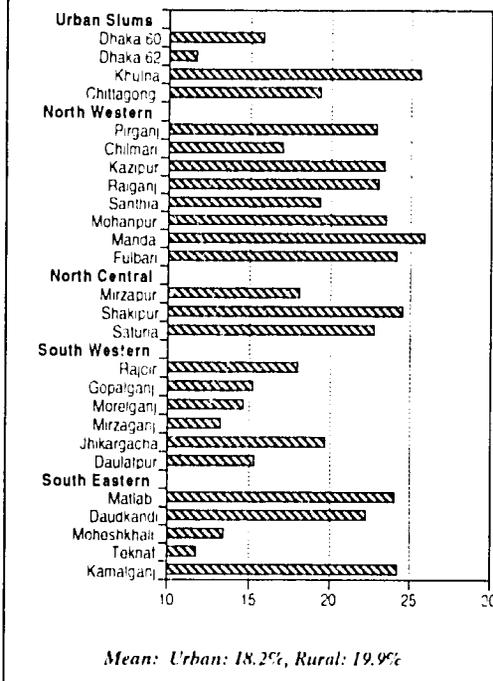
**Figure 1. UNDERWEIGHT**  
Percentage children 6-59 months old, who are undernourished by Wt/Age < 2Z Scores in 22 rural sentinel thanas in Bangladesh, June 1990 - August 1994.



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**Figure 3. WASTING**

Percentage of children 6-59 months old, who are undernourished by  $Wt/Ht < -2Z$  Scores in 4 urban slums and 22 rural sentinel thanas in Bangladesh, August 1994.



16.1% of children in the survey had had diarrhea within the last 24 hours (Figure 2) and 5.7% suffered from a fever. A severe reduction in coverage of vitamin A capsules (VAC) has occurred, only 31.1% of children had received a capsule in the last six months. This is the lowest coverage ever recorded by the NSP. In children 6-59 months, .66% of children suffered from nightblindness as reported by their mothers. For children 24-59 months, the nightblindness rate was .8% and for mothers themselves, 1.2%.

#### URBAN BANGLADESH

Rice prices in urban Bangladesh continued to rise; in August of 1993 rice was 9.4 taka per kilo, whereas this August rice was 12.6 taka per kilo. A 3 taka rise per kilo, to the average large family can result in a substantial increase in the proportion of their income that is spent on rice. The price of flour, potato, and beef also recorded increases.

Nutritional status in the four urban areas was mixed. Whereas wasting and underweight prevalences increased both stunting and MUAC < 125 mm stayed relatively similar to June's findings. All four urban slum areas reported increases in wasting resulting in a 2

percentage point increase. Chittagong continued to display alarming prevalences with 25.6% of the children surveyed wasted (Figure 3). Underweight prevalences rose in all the slum areas from an average of 71% to 73.2%. The prevalence of underweight children has risen steadily in the last four rounds of data collection.

Stunting remained consistent with the findings of June, hovering around 68%. The prevalence of severely stunted children averaged 33%. MUAC < 125 mm also stabilized at 10.5% which is similar to last round's figure of 10.8%.

Diarrhea in the urban areas has shown a somewhat flattening of seasonality in the last year. This round was no exception with a point prevalence of 12.8%. The urban slums in the NSP are NGO working areas and as a result over 93% of the children had received a Vitamin A capsule within the last 6 months. There were no reported cases of nightblindness.

#### DROUGHT PRONE AREAS

Two thanas covered in the NSP, Chilmari and Pirganj, fall under the areas considered to be affected by rain shortfalls this year. Although data from August is slightly early to assess the impact, the data shows that both thanas recorded increases in all indicators of malnutrition assessed. Pirganj in particular, exhibited the highest level of underweight children in over two years and its highest ever recorded wasting level (22.9%). However, many thanas showed increasing nutritional distress in this round; the northern areas will have to be carefully watched in the coming rounds to ascertain the full effect of the this year's poor rainfall in order to determine if special programs will have to be implemented.

*Notes: The following terms refer to children 6-59 months of age.*

*MUAC: The term is used in the text as shorthand to mean "the level of undernutrition assessed by the prevalence of MUAC < 125 mm"*

*Wasting: The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $Wt/Ht < -2Z$  scores"*

*Stunting: The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $Ht/Age < -2Z$  scores"*

*Undernutrition: The term is used in the text as shorthand to mean "the level of undernutrition as assessed by the prevalence of  $Wt/Age < -2Z$  scores"*

*Z scores: A method of comparing a child's nutritional status with normal, well fed children using the internationally accepted NCHS reference tables. Undernutrition is defined as a Z score less than -2.*



## Collaborating Organizations

Aga Khan Community Health Project (AKCHP)  
Bangladesh Rural Advancement Committee (BRAC)  
Comilla PROSHIKA  
CONCERN  
Family Planning Association of Bangladesh (FPAB)  
Gono Unnayan Prochesta (GUP)  
Gramteen Jano Kalyan Sangsad (GJKS)  
International Center for Diarrhoeal Disease Research, Bangladesh (ICDDR,B)  
Institute of Public Health Nutrition (IPHN)  
PROSHIKA  
Rangpur Dinajpur Rural Services (RDRS)  
Society for Health Extension and Development (SHED)  
United Nations Children's Fund (UNICEF)  
Christian Commission for Development in Bangladesh (CCDB)

### For information and correspondence contact:

Mr. Shawn K. Baker, Country Director  
Ms. Helen Matzger, Project Officer  
Helen Keller International, Bangladesh  
P.O. Box 6066 Gulshan  
Dhaka - 1212, Bangladesh

Telephone: 880 - 2 - 814234  
880 - 2 - 816156  
880 - 2 - 314408  
880 - 2 - 324048

Fax: 880 - 2 - 813310

Dr. Martin W. Bloem, Regional Technical Director  
Helen Keller International, Indonesia  
P. O. Box. 4338  
Jakarta, Indonesia

Telephone: 62 - 21 - 525 - 6364

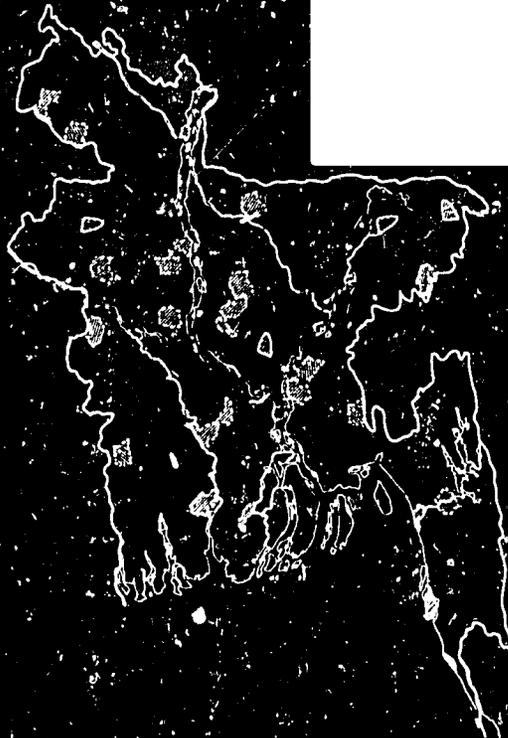
Fax: 62 - 21 - 520 - 7297

This project is funded by the United States Agency for International Development

# Nutritional Surveillance Project

Report of Round 28

October 1994 Data Collection



## SUMMARY

*In October 1994 six new rural thanas were added to the NSP from the northern and eastern regions of the country. High levels of stunting were recorded in the majority of the rural thanas, while wasting, underweight and MUAC decreased. In the rural areas, both loans for food and distress sales are at their highest levels in two years. The price of rice and other essential commodities continued to rise in both the rural and urban regions.*

**HKI/IPHN**

**Helen Keller International  
Institute of Public Health Nutrition  
Dhaka, Bangladesh**

# Nutritional Surveillance Project

## Report of October 1994 data collection

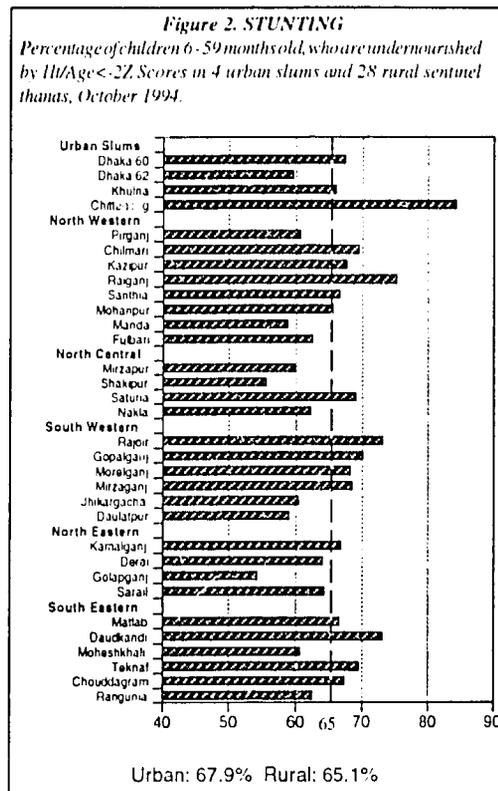
In the 28th Round of the NSP in October 1994 nutritional and health data were collected from 14,922 children 6-59 months old and socio-economic data was collected from 11,071 households. The sample covered 32 rural thanas and 4 urban slums. Six new thanas were added to the surveillance system in this round; Derai, Golapganj and Sarail from the Northeast, Chouddagram and Rangunia from the Southeast and Nakla from the central northern section of the country.

The prevalence of wasting and underweight in both the rural and urban areas decreased from August to October. This pattern is consistent with NSP findings from previous years. Stunting, the indicator of cumulative deficient growth, presents a varied picture over the long term for both the rural and urban areas; this round the prevalence has increased. MUAC findings remained consistent with the previous round.

### RURAL BANGLADESH

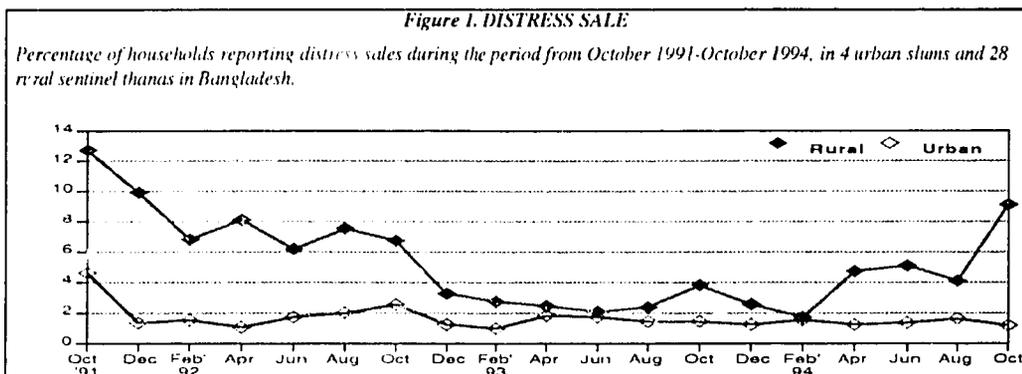
Rice prices have continued their upward trend in this round to 12.5 taka per kilogram. Similarly, the prices of the other food staples flour, dal, potatoes and oil have also risen. Since the inception of the NSP, October has been identified as the time of year when loans for food reach peak levels. This round is no exception with the level rising from 13.8% in August to 23.3% for October. Distress sales have also risen from the last round to 9.1% and are at the highest levels recorded by the NSP since 1991 (Figure 1).

Of the 22 old thanas, 16 showed an increase in the prevalence of stunting 14 of which have rates of 65% or above (Figure 2). Rates of wasting and underweight however have decreased in a majority of the thanas. Wasting which reached the highest rate recorded by the NSP in the August 1994 round at 19.9%, has dropped to



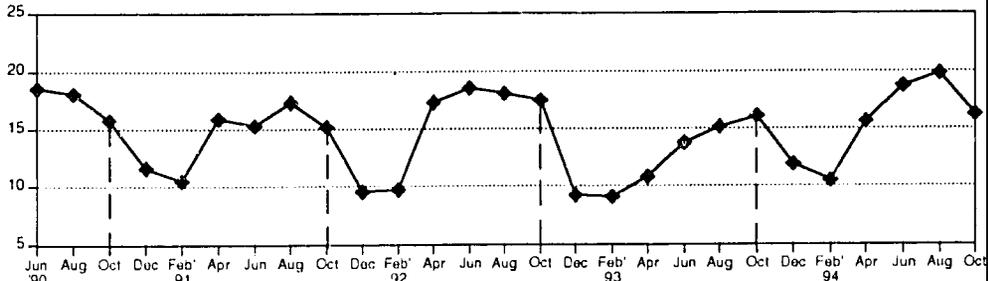
16.3% which although still high, is within the range of what is expected at this time of year (Figure 3). The slight decrease in underweight levels follows the same pattern as is seen in previous years between August and October. MUAC < 125 mm decreased in two thirds of the 22 thanas, and fell slightly from 11.5% in the previous round, to 11.3%. Of particular concern are the thanas of Santhia, Satura and Rajoir where prevalence rates are around 15% or more (Figure 4). It will be important to see how continued high rice prices and high levels of distress sales will affect nutritional status in December and February rounds.

Of the other health indicators the point prevalence of



**Figure 3. WASTING**

Percentage of children 6-59 months old, who are undernourished by  $W/Ht < -2$  Scores in 4 urban slums and 28 rural sentinel thanas in Bangladesh, October 1994.



diarrhea decreased to 13%. However in 5 of the thanas, which reported children having diarrhea lasting for more than 7 days, prevalence rates were over 30% and in the thana of Rajoir levels reached a high 41.1%. Night blindness in children 6-59 months old rose from .9% to 1.2% in this round. This figure increases to 1.7% for children 24-71 months of age. VAC (Vitamin A Capsule) coverage in the last 6 months is less than 50% in a majority of the thanas, with levels below 30% coverage in Chilmari, Santhia, Mirzapur, Satunia and Morelganj. The average of VAC coverage for children 6-71 months was 45%.

**URBAN BANGLADESH**

The price of rice in the urban areas has continued to climb to 13 taka per kilogram; the highest price ever recorded by the NSP. Of the other food staples, only the price of flour has continued to rise in this round. Food loans continued to rise to 13.4%; the highest rate recorded by the NSP since October 1991. Distress sales however dropped to the lowest level recorded for any October, at 1.2% (Figure 1).

Showing the same trend as in the rural thanas, the overall prevalence of wasting and underweight decreased in the urban slum areas in this round. Wasting dropped somewhat more than expected between August and October, from 18.2% to 13.8%. Underweight fell less dramatically to 71.4%. This was the lowest underweight level recorded for any October by the NSP. Conversely, the prevalence of stunting rose slightly to 69.7%, though rates over the last year and a half have remained fairly constant. MUAC < 125 mm rates remained similar to the previous couple of rounds at 17.8% (Figure 4).

The point prevalence of diarrhea fell from 12.8% to 9.3% this round; better than has been recorded in the previous 2 years of data collection. The almost total absence of night blindness in the four sentinel points, which are NGO working areas, reflects the high VAC distribution (96.2%).

*Stunting* : The percentage of children 6-59 months with height-for-age < -2 Z scores, chronic malnutrition.

*Wasting* : The percentage of children 6-59 months with weight-for-height < -2 Z scores, acute malnutrition.

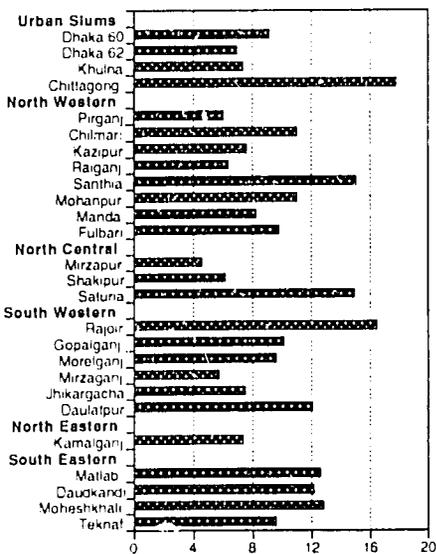
*Underweight* : The percentage of children 6-59 months with weight-for-age < -2 Z scores

*Mid-upper Arm Circumference* : A child 12-59 months with a MUAC < 125 mm is considered malnourished.

*Standard deviation scores*: Measure how far a child's nutritional status deviates from the internationally accepted reference population (NCHS). Malnutrition is defined as less than -2 standard deviations from the reference mean (< -2 Z scores).

**Figure 4. MUAC**

Percentage of children 12 - 59 months old, who are undernourished by MUAC < 125mm, in 4 urban slums and 22 rural sentinel thanas, October 1994.



Urban: 9.3% Rural: 10.4%

## Collaborating Organizations

Bangladesh Rural Advancement Committee, (BRAC)

Comilla PROSHIKA

CONCERN

Dhaka Urban Community Health Project, (DUCHP)

Family Planning Association of Bangladesh, (FPAB)

Gono Unnayan Prochesta, (GUP)

Gramheen Jano Kallyan Sangsad, (GJKS)

International Center for Diarrhoeal Disease Research, Bangladesh, (ICDDR,B)

Institute of Public Health Nutrition, (IPHN)

PROSHIKA

Rangpur Dinajpur Rural Services, (RDRS)

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United Nations Children's Fund, (UNICEF)

Christian Commission for Development in Bangladesh, (CCDB)

### For information and correspondence contact:

Mr. Shawn K. Baker, Country Director

Ms. Mya Kirwan, Project Officer

Mr. Ravi Loganathan, Project Officer

Helen Keller International, Bangladesh

P.O. Box 6066, Gulshan

Dhaka - 1212, Bangladesh

Telephone: 880 - 2 - 814234

880 - 2 - 816156

880 - 2 - 314408

880 - 2 - 324048

Fax: 880 - 2 - 813310

Dr. Martia W. Bloent, Regional Technical Director

Helen Keller International, Indonesia /

P. O. Box. 4338

Jakarta, Indonesia

Telephone: 62 - 21 - 526 - 3872

Fax: 62 - 21 - 525 - 0529

This project is funded by the United States Agency for International Development

# Nutritional Surveillance Project

Helen Keller International, Bangladesh

## Report of Round 29

### December 1994 Data Collection

#### Cooperating Organizations

Bangladesh Rural Advancement  
Committee (BRAC)  
Comilla PROSHIKA  
CONCERN  
Christian Commission for Development  
in Bangladesh (CCDB)  
Dhaka Urban Community Health Project  
(DUCHP)  
Family Planning Association of  
Bangladesh (FPAB)  
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(UNICEF)



#### For information and correspondence contact:

Mr. Shawn K. Baker, Country Director  
Ms. Mya Kirwan, Project Officer  
Mr. Ravi Loganathan, Project Officer  
Helen Keller International, Bangladesh  
P.O. Box 6066 Gulshan  
Dhaka - 1212, Bangladesh

Telephone: 880-2-814234/816156  
Fax: 880-2-813510

Dr. Martin W. Bloem, Regional Technical Director

Helen Keller International, Indonesia  
P. O. Box 4338  
Jakarta, Indonesia

Telephone: 62-21-526-3872  
Fax: 62-21-525-0529

*This project is funded by the United States Agency for International Development*

# Nutritional Surveillance Project

RURAL BANGLADESH

## Report of December 1994 data collection

### SUMMARY

The December 1994 round of data collection showed high levels of stunting in the majority of the rural thanas, while wasting, underweight and MUAC continued to decline as seen in previous years. The same holds true for the urban slums. The percentage of families taking loans for food or who made distress sales, declined in the rural thanas, but were still high for this time of year. However, there was a relative increase in these two indicators in the urban slums. The price of rice and other essential commodities continued to rise in both the rural and urban areas.

### INTRODUCTION

In the 20th round of the NSP in December 1994, nutritional and health data were collected from 15,166 children 6-59 months old and socioeconomic data was collected from 11,350 households. The sample covered 28 rural thanas and 4 urban slums.

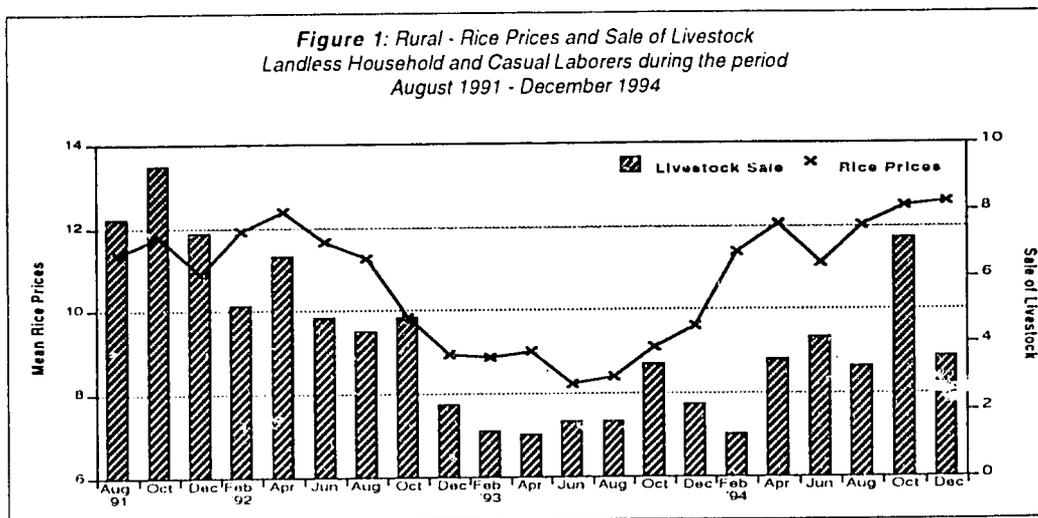
The December round of data collection comes after the Aman harvest, still the primary source of rice in Bangladesh. However, this season due to low rainfall there has been a general shortfall in the harvest yield. Nonetheless, this is a time of increased food intake which is reflected in the improvement in the rates of undernutrition measured by wasting, underweight and MUAC <125mm.

**Market Information** - Rice prices usually peak in March-April and September-October, representing the traditional pre-harvesting periods. However, in 1994, rice prices have continued to rise since June. Rice prices in the rural thanas have increased to Tk 12.6 per kg; the highest price recorded by the NSP since its inception in June 1990. In December 1993, rice prices were at Tk 9.5 per kg. The prices of other essential foods also continued to rise in this round; ata (flour) and dal are Tk 9.9 per kg and Tk 28 per kg, respectively.

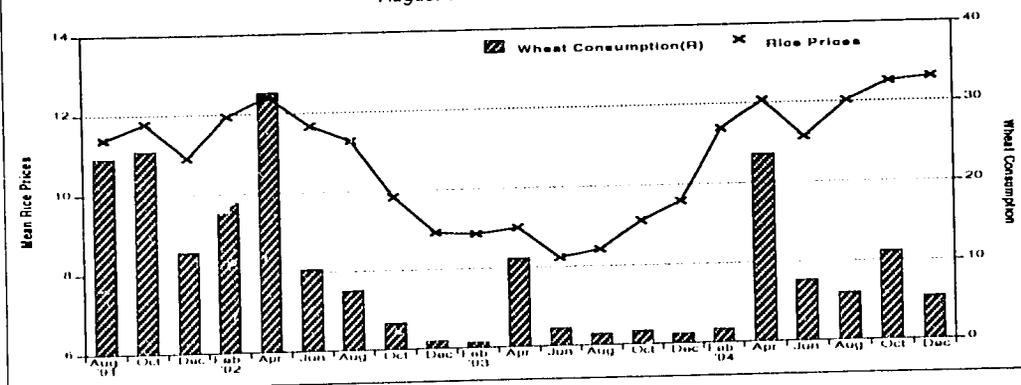
**Socioeconomic Indicators** - The socioeconomic status of the rural thanas returned to seasonally expected levels for this round. For instance, measures of distress, defined by the percentage of families taking loans for food and the percentage of families making distress sales returned to seasonal levels. Loans for food fell from 23.3% in October to 17.0% in this round. Distress sales also fell from 9.1% to 4.4%. Despite the decline of these distress indicators they are both still at the highest levels recorded for this time of year since December 1991.

Throughout the NSP longitudinal data, children from (a) families with no land (b) families whose principal wage earner is dependent on casual or short term labor are nutritionally more distressed than children from families with land or that have a permanent wage income. Special analysis was undertaken to determine the status of these vulnerable groups in this round. Distress sales, measured by the sale of livestock, for both the landless and casual laborers dropped from 7.2% in October to 3.6% in December (Figure 1). Loans for food consumption also declined from 30.1% in October to 22.2% in December. However, these indicators are still at the highest levels recorded for this time of year since December 1991.

**Figure 1: Rural - Rice Prices and Sale of Livestock**  
Landless Household and Casual Laborers during the period  
August 1991 - December 1994



**Figure 2: Rural - Wheat Consumption and Rice Prices**  
Landless Household and Casual Laborers during the period  
August 1991 - December 1994



Patterns of consumption of food staples for vulnerable groups was also analyzed. Rice purchased in the market for consumption by landless and casual laborers, declined from 89.5% in October to 76.1% in December; the lowest figure for any December collected by NSP. Wheat measured by wheat purchased in the market for consumption, also declined from 11.2% of households having purchased in the last week in October to 5.5% in December. However, 5.5% is still the highest level of wheat consumption for any December recorded by the NSP, since December 1991. This trend is partly explained by the continued rise in rice prices and wheat being the cheapest alternative food source for the rural poor (Figure 2).

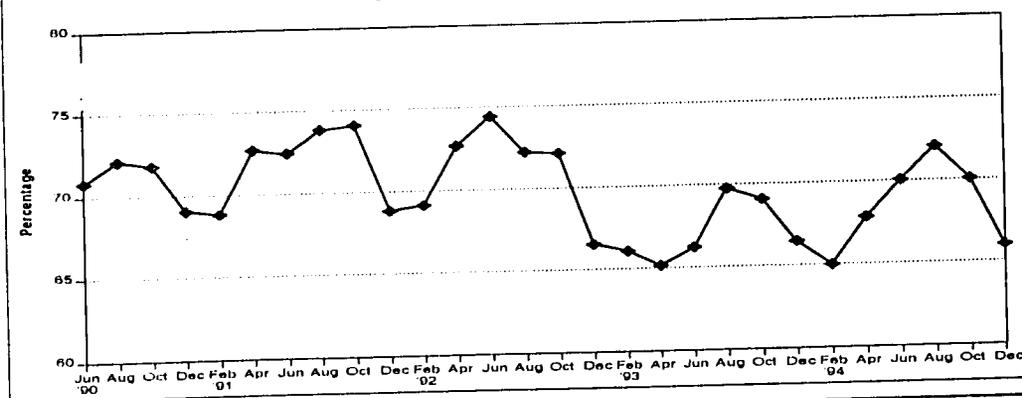
**Nutritional Indicators** - Most nutritional indicators improved for the period between October and December, a pattern consistent with previous years' findings. Overall levels of acute and chronic undernutrition have returned to levels expected at this time of year in Bangladesh, though by international standards they are very high.

In all 28 of the rural sentinel thanas there was a drop in the prevalence of undernutrition by wasting. The point prevalence at 11.6% is within the range expected for December. Similarly a decline was recorded in the prevalence of undernutrition by MUAC <125 mm and underweight for over 3/4 of rural thanas. MUAC <125 mm at 7.3% remains consistent with previous years. The overall prevalence of underweight at 66% is the lowest rate documented by the NSP for any December (Figure 3).

Conversely, rates of stunting have continued to climb steadily since June. In 18 of the 28 rural thanas prevalences increased and in 11 of these stunting displayed rates of over 70%. It appears that the progress made towards reducing stunting has been eroded with continued high rice prices (Figure 4).

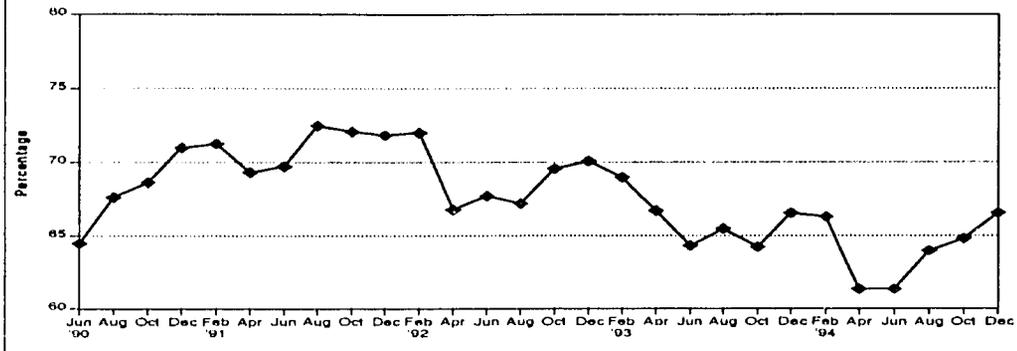
The prevalence of diarrhea decreased in a majority of the rural sentinel points to 11.3%. Sentinel thanas at risk with diarrhea rates over 15% were Raigonj, Santhia, Morelganj, Moheskhali, Teknaf, Dera and Golapganj. Night blindness

**Figure 3: UNDERWEIGHT**  
Percentage of Children 6-59 months old, who are undernourished by W/Age <-2Z scores in 28 rural sentinel thanas in Bangladesh, June 1990 - December 1994.



**Figure 4: STUNTING**

Percentage of Children 6-59 months old, who are undernourished by  $H/Age < -2Z$  scores in 28 rural sentinel thanas in Bangladesh, June 1990 - December 1994.



in children 6-59 months was at 1.1% and looking only at children 24-71 months old this figure increases to 1.6%. These figures are similar to those from the last round and somewhat high for December. Vitamin A capsule (VAC) coverage for children 6-71 months was similar to the last round at 44.5%. In a majority of the thanas VAC coverage in the last six months was below 50%; Santhia, Mirzapur, Rajoir, Morelgonj, Moheskhalia, Nakla and Rangunia thanas show distribution levels below 30%.

#### URBAN BANGLADESH

**Market Information** - Rice prices in urban areas have continued to rise since February; from a February price of Tk 11.3 per kg to a December price of Tk 14.2 per kg. This December the price of rice is the highest ever recorded by the NSP at any time of the year. In December 1992 the price of rice was Tk 10.7 per kg and in December 1993 Tk 9.6 per kg. Prices of other essential foods have also continued to rise. Prices of ata (flour) and dal increased to Tk 11.3 per kg and Tk 28.7 per kg, respectively.

**Socioeconomic Indicators** - A reflection of these consistently high food prices is seen in the increasing rates of households who took loans for food and made distress sales. Both of these socioeconomic indicators, loans for food at 13.6% and distress sales at 1.5%, are higher than has been recorded by the NSP for any December.

Special analysis was undertaken to determine the status of vulnerable groups in the urban areas. Distress sales for casual or short term laborers increased from 2.2% in October to 2.9% in December. It is the highest rate for any December. Loans for food consumption for the same group also increased from 23.6% in October to 25% in December. Once again, it is the highest rate for any December. Patterns of consumption of food staples for vulnerable groups closely resembled the movements in the market prices of essentials. Patterns of wheat consumption increased from 12.5% of households having purchased in

the last week in October to 15.6% in December. Again, this trend is reflecting the continued rise in rice prices and wheat being the cheapest alternative food source.

**Nutritional Indicators** - Nutritional status in the urban slums shows the same pattern as in the rural thanas with prevalence of wasting, underweight and MUAC declining in this round while stunting has continued to increase. Rates of undernutrition by stunting in the urban slums rose to 70%. Of continued concern is Chittagong with a point prevalence rate of 81.8%.

As with the rural thanas wasting levels decreased in all the slum areas with a prevalence in this round down to 9.1%, the lowest ever recorded by the NSP. The percentage of undernutrition by underweight was down from 71.4% in October to 69.2% in this round. Rates of MUAC were also down from 8.7% in the last round, to 7.2% for December.

Of the other health indicators diarrhea was down to 7.8% in this round, lower than has been recorded for any previous December. The total absence of night blindness in the urban slum wards, which are NGO working areas, reflects the high VAC distribution at 96.1%.

*Stunting* : The percentage of children 6-59 months with height-for-age  $< -2Z$  scores, chronic malnutrition.

*Wasting* : The percentage of children 6-59 months with weight-for-height  $< -2Z$  scores, acute malnutrition.

*Underweight* : The percentage of children 6-59 months with weight-for-age  $< -2Z$  scores.

*Mid-upper Arm Circumference* : A child 12-59 months with a MUAC  $< 125$  mm is considered malnourished.

*Standard deviation scores* : Measure of how far a child's nutritional status deviates from the internationally accepted reference population (NCHS). Malnutrition is defined as less than  $-2$  standard deviations from the mean ( $< -2Z$  scores).

# Nutritional Surveillance Project

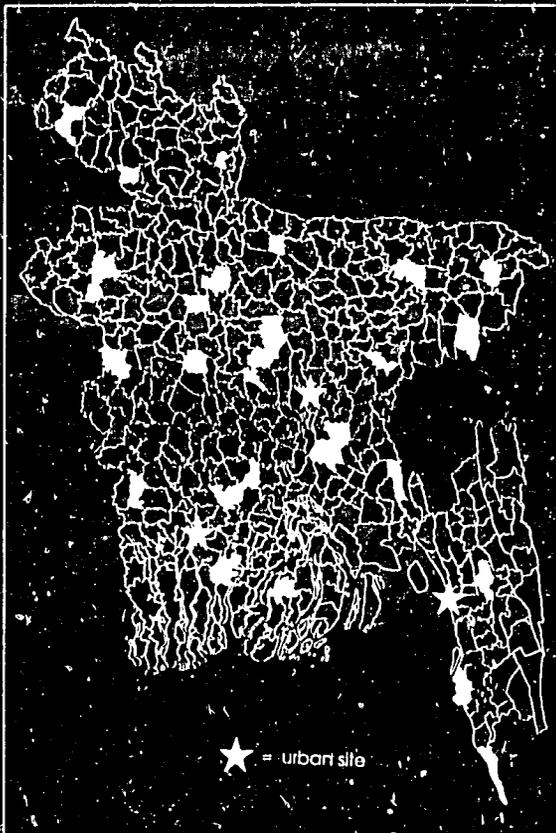
Helen Keller International

## Report of Round 30

### February 1995 Data Collection

#### Cooperating Organizations

- Bangladesh Rural Advancement Committee (BRAC)
- Comilla PROSHIKA
- CONCERN
- Christian Commission for Development in Bangladesh (CCDB)
- Dhaka Urban Community Health Project (DUCHP)
- Family Planning Association of Bangladesh (FPAB)
- Gono Unnayan Procheta (GUP)
- Grameen Jano Kallyan Sangsad (GJKS)
- International Center for Diarrhoeal Disease Research, Bangladesh (ICDDR,B)
- Institute of Public Health Nutrition (IPHN)
- PROSHIKA
- Rangpur Dinajpur Rural Services (RDRS)
- Society for Health Extension and Development (SHED)
- United Nations Children's Fund (UNICEF)



#### For information and correspondence contact:

Mr. Shawn K. Baker, Country Director  
Ms. Mya Kirwan, Project Officer  
Mr. Ravi Loganathan, Project Officer  
Helen Keller International, Bangladesh  
P.O. Box 6066 Gulshan  
Dhaka - 1212, Bangladesh

Telephone: 880 - 2 - 814234/816156  
Fax: 880 - 2 - 813310

Dr. Martin W. Bloem, Regional Technical Director

Helen Keller International, Indonesia  
P. O. Box 4338  
Jakarta, Indonesia

Telephone: 62 - 21 - 526 - 3872  
Fax: 62 - 21 - 525 - 0529

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# Nutritional Surveillance Project

## Report of February 1995 data collection

In the 30th round of the NSP in February 1995, nutritional and health data was collected from 15,224 children 6-59 months old and socioeconomic data was collected from 11,414 households. The sample covered 28 rural thanas and 4 urban slums.

The February round of data collection falls within the season (December - March) when employment opportunities for the rural landless increase with the harvest of Aman rice and the planting of Boro rice, wheat and other winter crops. However, due to low rainfall there has been a general shortfall in the harvest yield. Nonetheless, this is a time of increased food intake and employment opportunities which is reflected in the improvement in the rates of undernutrition measured by wasting, underweight and MUAC <125mm.

### RURAL BANGLADESH

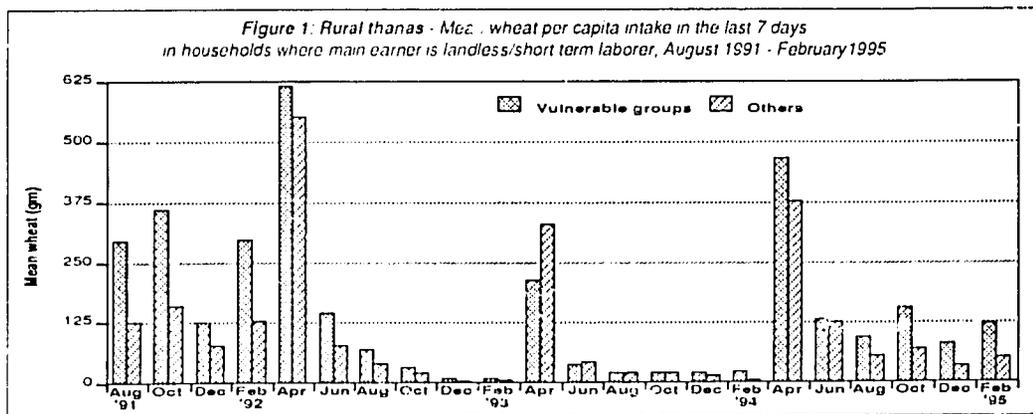
**Market Information** - In 'normal' years, the period of December through March represents the season where food grain prices fall. However, since June 1994, rice prices have continued to rise. For instance, rice prices in rural thanas have increased to Tk 13.8 per kg; the highest price recorded by the NSP in June 1990. The prices of other essentials such as ata (flour) and dal also increased to Tk 10.8 per kg and Tk 29.5 per kg respectively.

**Socioeconomic Indicators** - Socioeconomic status of rural thanas returned to seasonally expected levels. Measures of distress, defined by the percentage of families taking loans for food and making distress sales returned to seasonal levels. Loans for food declined from 17.0% of households in December to 16.3% in this round. Distress sales also declined from 4.4% in December to 2.2% in February.

NSP data shows that children from (a) families with no land and (b) families whose principal wage earner is dependent on casual or short term labor are nutritionally more distressed than those with land or permanent wage income. Analysis was undertaken to determine the status of these vulnerable groups. Distress sales measured by the sale of livestock, for both the landless and casual labor dropped from 3.6% in December to 1.8% in February. Loans for food consumption for the same group also declined to 21.9% in February. However, these are the highest levels recorded at this time of the year for these groups since February 1992.

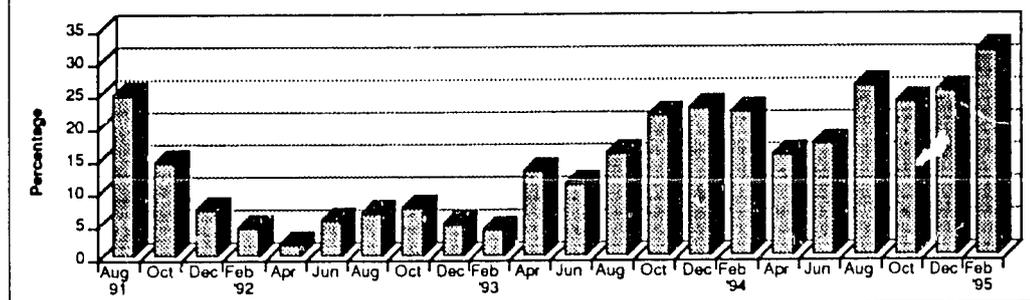
Consumption patterns for the above groups were also analyzed. Wheat consumption, measured by wheat purchased in the market for consumption, increased from 5.5% of households reporting in December to 8% in February. This is the highest level of households reporting wheat consumption since February 1992 for these groups. This trend is partly explained by the continued rise in rice prices and wheat being the cheapest alternative grain for the rural poor.

Household food availability was assessed for the vulnerable groups and the rest of the sample by household rice and wheat intake on a per capita basis in the previous week. Per capita rice and wheat intake was calculated by dividing the total household intake by the number of family members who eat together in that household. Mean per capita rice intake for the vulnerable groups declined from 3033 gm in December to 2972 gm in February. Rice intake for the rest of the sample also declined from 3324 gm in December to 3206 gm in February. However, mean per capita wheat intake for the vulnerable groups increased from 82 gm in December to 125 gm in February. Wheat intake for the rest of the sample also increased from 38 gm to 53 gm (Figure 1). Overall mean grain intake per capita for the last seven days decreased from 3115 gm in December to 3098 gm in February for the vulnerable groups. Once again, this trend is partly explained by the continued rise in rice prices and wheat being the alternative source for the rural poor.





**Figure 4: Urban wards - Percentage of households where main earner is casual/short term laborer taking loans for food consumption, August 1991 - February 1995**



## URBAN BANGLADESH

**Market Information** - Rice prices in urban areas have continued to rise since February 1994 at Tk 11.0 per kg to a February 1995 price of Tk 14.6 per kg. This February the price is the highest ever recorded by the NSP at any time of year. Prices of other essential goods have also continued to rise. Prices of ata (flour) and dal increased to Tk 12.0 per kg and Tk 30.2 per kg respectively.

**Socioeconomic Indicators** - A reflection of these consistently high food prices is seen in the increasing rates of households who took loans for food. Loans for food increased from 13.6% in December to 17.2% in February. However, distress sales declined from 1.5% in December to 1.3% in February.

Analysis was undertaken to determine the status of vulnerable groups (casual or short term labor) in the urban areas. Distress sales for casual or short term labor declined from 2.9% in December to 1.8% in February. However, loans for food consumption for the same groups increased from 25% in December to 31.5% in February. This is the highest rate for any February for these groups ever recorded by NSP (Figure 4). Consumption of wheat, measured by wheat purchased in the market for consumption, decreased for the vulnerable groups from 15.6% of households reporting in December to 14.6% of households reporting in this round.

Household food availability was assessed for the vulnerable groups. Mean per capita rice intake declined from 2386 gm in December to 2351 gm in February. Rice intake for the rest of the sample increased from 2512 gm in December to 2520 gm in February. Mean per capita wheat intake for the above groups decreased from 265 gm in December to 164 gm in February. Wheat intake for the rest of the sample also decreased from 150 gm in December to 114 gm in February. Overall mean grain intake per capita for the last seven days decreased from 2651 gm in December to 2515 gm in February for these groups.

**Nutritional Indicators** - As with the rural nutritional indicators there has been an overall improvement in levels of undernutrition by wasting, stunting, underweight and MUAC < 125mm. Stunting dropped in the February round to 69.1% with rates over the last 14 months remaining fairly constant at or below 70%.

There was a decline in the prevalence of wasting from 9.1% to 8.3% in February, producing the lowest figure recorded by the NSP since its inception. In all four of the urban slum wards the prevalence of undernutrition by underweight also fell in this round, and in both the Dhaka and Khulna slums rates were below 65%. As in the rural areas the point prevalence for this February is the lowest rate recorded by the NSP at 64.3%. MUAC continues to fall in this round to 6.3%.

Conversely the prevalence of diarrhea rose slightly from 7.8% in December to 8.9% in February. However, none of the slum wards exhibited rates over 13%. The almost total absence of night blindness in the slum wards, which are NGO working areas, continues to reflect the high VAC distribution levels at 97.2% of children who received a capsule in the last 6 months.

*Stunting* - The percentage of children 6-59 months with height-for-age < -2 Z scores, chronic malnutrition

*Wasting* - The percentage of children 6-59 months with weight-for-height < -2 Z scores, acute malnutrition.

*Underweight* - The percentage of children 6-59 months with weight-for-age < -2 Z scores

*Mid-upper Arm Circumference* - A child 12-59 months with a MUAC < 125 mm is considered malnourished

*Standard deviation scores* - Measure how far a child's nutritional status deviates from the internationally accepted reference population (NCHS). Malnutrition is defined as less than -2 standard deviations from the mean (< -2 Z scores).