

**PREVENTION OF RICKETS THROUGH NUTRITION**

**BASELINE IDENTIFICATION REPORT ON  
AWARENESS, PREVENTION, EARLY DETECTION AND APPROPRIATE  
TREATMENT, OF RICKETS IN 3 UPAZILAS OF COX'S BAZAR DISTRICT**



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## **Annexure:**

- Annex-1 Complete set of tables*
- Annex-2 Questionnaire*

## Abbreviation

BRAC	-	Bangladesh Rural Advancement Committee
FGD	-	Focus Group Discussion
HH	-	Household
ICMH	-	Institute of Child and Mother Health
NGO	-	Non-Government Organization
NNP	-	National Nutrition Project
PC		Palli Chikitshak
PCSL	-	Pathways Consulting Services Ltd.
RMP		Rural Medical Practitioners
SARPV	-	Social Assistance and Rehabilitation of the Physically Vulnerable
SRS	-	Systematic Random Sampling
TW	-	Tube Well

# Chapter One

## Background and Objectives

### 1.1 Rickets in Bangladesh

**Prevalence of Rickets in Bangladesh:** In Cox's Bazar District, an epidemic of Rickets began two decades ago. It was first brought to broad attention in 1991 by workers from Social Assistance and Rehabilitation of the Physically Vulnerable (SARPV) visiting the Chakaria region of southeastern Bangladesh after a devastating cyclone (*Craviari et al, in press*). An informal village survey found that approximately 1% of children had rachitic deformities. Focus groups and local informants suggested that rickets was "new" and had not been seen before the early 1970s.



In 1994, French physicians with "Les Amis des Enfants du Monde (AEM)" evaluated patients in communities from Chittagong to Moheshkhali and identified rickets in 4.5% of total children under 15 years old (*Cima et al, 1994*). Typically, findings of rickets were reported as beginning in the second and third years of life. In 1997, academicians from Cornell University and other American institutions were apprised of the situation (*Abel et Combs, 2001*). A collaborative assessment revealed that rickets was more common than suspected



in Chakaria, it was not generally associated with vitamin D deficiency, and it was related to dietary insufficiency of calcium. An international "Rickets Consortium" was formed to stimulate collaborative research and practical interventions. This group subsequently re-formed as the current Rickets Convergence Group which serves as a repository of information and a source of expertise to facilitate ongoing work related to rickets in Bangladesh. This group include specialists of calcium deficiency rickets such as Prs J M Pettifor (Paediatrician, Johannesburg, South Africa), P Fischer (Paediatrician, Mayo Clinic, USA) and T Thacher (Medical doctor, Jos University Hospital, Nigeria) as well as other professionals from France : J Arnaud (biologist, University Hopital Grenoble), JM Bouvard (General Practitioner, Aide Médical et Développement (AMD), JP Cimma (Padiatrician , Shahidul Association), T Craviari (orthopaedic paediatric surgeon, AMD), AS

Rouveure, Agronomist, Shahidul Association) and Bangladesh S Haque (Founder of the Social Assistance and Rehabilitation of the Physically Vulnerable), and C Meisner (Agronomist, CIMMYT), SK Roy (Senior scientist, ICDDR-B), S Reza (Medical doctor, CARE).

Helen Keller International conducted a nationwide survey in 2000 and repeated it in 2004.

“Rickets” was identified as visible varus and/or valgus deformities in children aged 1-15 years. Nationally, rachitic deformities were found in 0.26% in 2000 and in 0.12% in 2004. Rickets was found in more than half of 24-28 upazilas (sub-districts) surveyed with the highest prevalence’s being found in Sylhet (NE) and Chittagong (SE) Divisions. The highest prevalence (1.4% of 1-15 year olds with visible rachitic deformities) was found in the Cox’s Bazaar upazila. A survey of all inhabitants in Chittagong carried out by the Bangladesh Rural Advancement Committee (BRAC) found rachitic deformities in 0.9% of the population (*Karim et al, 2004*).

A more detailed survey conducted by the Institute of Child and Mother Health (ICMH) in the Chittagong Division in 1998 found that 8.7% of children had at least one clinical finding indicative of rickets; 4% had lower limb deformities suggestive of rickets; 0.9% had radiological evidence of active rickets; and 2.2% had elevated serum alkaline phosphates levels (*Kabir et al, 2003*).

The latest survey, conducted by SARPV in 2006 in Chakaria upazila, found rickets in 0.9% of the total population surveyed.

Interestingly, rickets has not been identified in the populations indigenous to the Chittagong Hill Tracts.

***Etiology of rickets in Bangladesh:*** In Bangladesh, initial studies suggested that vitamin-D deficiency was not a major causal factor in rickets in Bangladesh, and calcium deficiency is assumed to be the primary etiologic factor. Changing cropping patterns in Bangladesh may be contributing to a reduction in dietary intake of calcium: in the last two decades, rice production has greatly increased and crop rotation and milk production have decreased. While underweight and stunting in children have become less common, the diet is less varied than it was three decades ago, and the diet contains less calcium. Boys seem to be more likely to develop rachitic deformities than girls, and rickets is associated with larger family sizes and less maternal education. Rickets is associated with respiratory illness but not with malaria or anaemia. Similarly, toxins, food patterns, and overall nutritional status are not associated with the prevalence of rickets among Bangladeshi children. The relationship between rickets and diarrhoea remains controversial. Genetic factors that potentially impact the risk of nutritional rickets have not been studied (*Abel et Combs, 2001; Hassan et Combs, 2002*).

***Treatment of rickets in Bangladesh:*** From 2001 to 2007 Aide Médicale et Développement (AMD), SARPV and the CRG treated and followed up more than 3000 rickets children in the Chakaria Disabled Centre. It has been proven that 77 % of the children less than 6 years old who have an early stage of active rickets can be treated through nutritional advice (*Arnaud et al, 2007*). Only 17%, who have greater leg deformities, need medical treatment. Bracing or surgery is needed only for 6% of children with rickets.

## 1.2 The Project and Its Objectives

In the stated situation, Social Assistance and Rehabilitation of the Physically Vulnerable (SARPV) took up a three-year project entitled “Awareness, Prevention, Early Detection and Appropriate Treatment, of Rickets” starting from 3 upazilas of Cox’s Bazar district with partial support from UNICEF. The upazilas are: Chakaria, Cox’s Bazar Sadar and Moheshkhali. As mentioned above, the district was identified due to high prevalence of Rickets related deformities among the children which has severe consequences in terms of disability.

This three-year project implemented by SARPV has the following to achieve:

- ∅ Awareness raising of the population on dangers of Rickets and some visible physical features of Rickets and iodine deficiency
- ∅ Training the population about identifying early cases of Rickets through some visible physical features of Rickets
- ∅ Prevent childhood Rickets and iodine deficiency through dietary intake
- ∅ Referral services to special facilities for necessary information and management of beyond prevention cases of the Rickets affected children.

It is expected that the project will cover entire population in the awareness raising and prevention of the rickets program throughout the 3 upazilas involving the NNP program, CARE, Plan International and other NGOs those working at the grass roots level in Cox’s Bazar district.

## 1.3 Expected Outcome and Output of the Project

The project has two expected outcomes and corresponding sets of outputs, which will be achieved within 3 years of the project inception:

**Outcome 1:** children in 3 upazilas of Cox’s Bazar District (Chakaria, Cox’s Bazar Sadar, and Moheshkhali) have reduced calcium deficiency, and children with early cases of rickets are treated through nutrition.

**Outputs** (expected results):

- a) At least 50% households are aware of rickets, its early signs and consequences in terms of disability, its prevention through improved calcium dietary intake, and where to go for treatment.
- b) Children in 800 families per year (total 2400 families for the 3 years of the program) receive nutritional therapy for rickets.

**Outcome 2:** School children aged 6-10 years in 3 upazilas of Cox’s Bazaar District

(Chakaria, Cox's Bazar Sadar, and Moheshkhali) have come under the rickets and iodine program.

**Outputs** (expected results):

- a) At least 50% households are aware how to prevent the rickets disease and at least two benefits of iodized salt.
- b) Coverage of households using iodized salt increased from 21% to 50% in the project area.

**1.4 The Baseline Survey for identification of the rickets children.**

To start with SARPV wanted to establish a benchmark of the project in the three project upazilas through a baseline survey with the following objectives:

- ⇒ to identify and describe the present status of knowledge, attitude and practice about Rickets; and
- ⇒ use of iodized salts

## Chapter Two

# Survey Methodology and Implementation

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### 2.1 Methodology and Sampling Design

The following three methods were adopted to gather field data:

- a) **Literature review:** In the process of developing the data collection instruments, all relevant documents received from SARPV and other sources were reviewed.
- b) **Sample survey:** A questionnaire survey has been among randomly drawn household from all the three projects upazilas.
- c) **Focus Group Discussion (FGD):** For a deeper understanding of the study variables and also to supplement the finding of the sample survey, several FGDs were conducted with the mothers of children less than 5 years of age.

The field survey was conducted in all the three project upazilas of Cox's Bazar district. Independent samples were drawn from the three upazilas so that the estimates are reliable to a reasonable degree and can be compared with the same at any post intervention period.

Multi-stage sampling technique was used to draw the sample households from which the parents (preferably mothers) were interviewed. The households selected had a child from 6 months up to 5 years of age.

Both the survey and the FGDs were done among the households from the lower economic segment of the population.

### 2.2 Size of Sample

The primary objective of the survey has been to calculate the proportion of targeted audience aware of Rickets, iodine deficiency and related issues. The principle of determining sample size had been to go for a size that fits with the reasonable range for precision and within the budget available. The sample size has been calculated using the equation below. The sample size equation for point estimates is (Lemeshow et al. 1990):

$$n = \frac{z^2 \cdot p \cdot q}{r \cdot e^2} Deff$$

Where n is the sample size, 'z' the z-score, 'p' is the estimated population proportion of a desired variable, q = 1-p, 'Deff' is the design effect, 'r' is the response rate, and 'e' the precision or the distance from the prevalence estimate in either direction.

The z-score can be set at the 95% level for a two-tailed test (z=1.96). The response rate was set to 90% (0.9). The design effect has been set to 1.5. The sample size is determined with a precision of 10% (0.1) on either side. As there is no previous estimation of awareness, we considered 50% prevalence, which always maximize the sample size. Substituting these values in the equation above gives a sample size of 160 per upazila.



For a wider spread of the sample, 16 spots were selected from each upazila and 10 households drawn for interview per spot. At first, four unions were selected at random from each upazila and 4 villages were selected consulting the list of villages of the unions. From each selected village, a cluster of households of size at least 20 were listed having children from 6 months to 5 years. These clusters will be selected in the lower socio-economic areas of the village. 10 households will be selected from the list using systematic random sampling (SRS) technique.

The table below shows the number of sample size and the spread of the same.

Upazila	Union #	Spot/ Village #	Sample HH
Chakoria	4	4 x 4 = 16	16 x 10= 160
Cox's Bazar	4	4 x 4 = 16	16 x 10= 160
Moheshkhali	4	4 x 4 = 16	16 x 10= 160
<b>Total</b>	<b>12</b>	<b>48</b>	<b>480</b>

**FGD:** In addition to the questionnaire survey, 6 FGDs were conducted with 2 FGDs per upazila. These FGDs were conducted among the mothers eligible for the survey. In each FGD there was 9-14 participants.

Discussion were held about the overall economic condition of the community, usual disease pattern of the children, sources of treatment, existence of disable members in the community, organizations working on disability, safe water and sanitation practices of the participating members and the community, habit of giving particular vegetables to the children up to 5 years of age, awareness and use iodized salt and finally the awareness of 'Rickets' and the existence of 'Rickets' symptom among the young children.

### 2.3 Data Collection Instrument

A simple questionnaire was developed to conduct interviews with the mothers. The project document of SARPV contains the areas where improvements would take place due to the field activities. Apart from the knowledge questions, data have been collected on attitude and practices that relate to the problem specially Rickets. The FGD guideline was prepared to cover wider range of information. For technical matters the agency depended entirely on SARPV officials. Both the data collection instruments were approved by the Chief Executive Mr. Shahidul Haque of SARPV before they were used in the field.



### 2.4 Management and Implementation

The study has been designed and implemented by this agency (PCSL) using the services of a research consultant who also produced the report. However, the field data has been collected by the SARPV field workers who were trained by the consultant at site. SARPV provided all logistic support to the Consultant.

## Chapter Three

### Presentation of Survey Findings

#### 3.1 Introduction

The collected data as per the questionnaire were computerized after proper editing and coding. Then they were processed to get the detail tables. Primary tables have been constructed for each study variables by the three upazilas and the total.

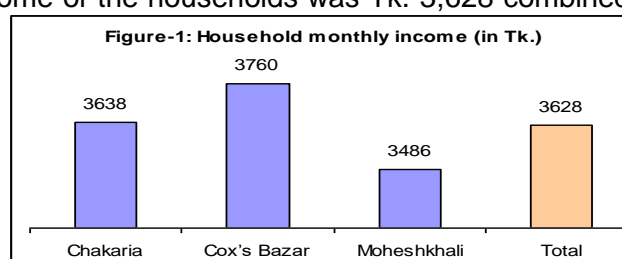
To begin with we have presented the characteristic of the sample household and the profile of the head of household so as to get the overall socio-economic status of the sample households. It will help establish the feel that the samples were drawn from the appropriate target population. This will be useful while compare the result collected at a latter period.

The findings are presented below conducted the survey findings supplemented by the FGD results sequentially by the issues.

#### 3.2 Household Characteristics

All the households had at least one child between 6 months and 5 years, by choice. These households had, on an average, 3.5 children under 15 years with little variation among the three upazilas.

**Monthly income:** The average monthly income of the households was Tk. 3,628 combined three upazilas with lowest (Tk. 3,486) in Moheshkhali upazila and highest Tk. 3,760 in Cox's Bazar sadar upazila. Moreover, it has been found that currently 91% of the households have a monthly income within the range of up to Tk. 5,000 (Table-3.1).



**Table- 3.1:** Distribution of reported monthly income of the sample households

Indicator	Chakaria	Cox's Bazar	Moheshkhali	Total
Less than Tk. 2,000	11.9	12.5	6.3	10.2
Tk. 2,001-3,000	50.0	45.6	69.4	55.0
Tk. 3,001-5,000	30.6	29.4	18.1	26.0
Tk. 5,001-10,000	6.3	11.9	5.6	7.9
Tk.10,000 +	1.3	0.6	0.6	0.8
<b>N = All</b>	<b>160</b>	<b>160</b>	<b>160</b>	<b>480</b>

It may be observed for the income distribution that in Cox's Bazar upazila the sample households came with higher population both in the lowest and the highest income segment.

### 3.3 Profile of the Heads of Households

The head of the sample households had an average age of 34.4 years with about 43 percent being below 30 years and 3 percent above 50 years. The age stratum of these persons was almost the same in all the three project upazilas. It may be mentioned that only 2 percent of the households were female headed.

**Occupation:** Combined three upazilas, the occupation of the heads of the households, in order of frequency, were: day labour, business, agri-farming, rickshaw/ van pulling and service. Day labour was significantly higher in Cox's Bazar (56%) and fisherman in Moheshkhali upazila (15%).

**Table-3.2:** Occupation of the head of households, by upazila.

Indicator	Chakaria	Cox's Bazar	Moheshkhali	Total
1. Day labour	15.6	55.6	33.8	35.0
2. Agriculture/ Farmer	31.9	4.4	6.9	14.4
3. Business/ shop owner	19.4	20.0	19.4	19.6
4. Rickshaw/Van puller/ Boatman	11.9	0.6	10.6	7.7
5. Service	3.1	13.8	5.6	7.5
6. Fishermen	6.9	-	15.0	7.3
7. Skilled labour	4.4	.6	5.6	3.5
8. Driver	3.1	3.1	1.3	2.5
9. Living abroad	1.3	1.3	1.3	1.3
10. Teacher/professor	1.9	-	-	0.6
11. Unemployed	-	0.6	0.6	0.4
12. Beggar	0.6	-	-	0.2
<b>N = All</b>	<b>160</b>	<b>160</b>	<b>160</b>	<b>480</b>

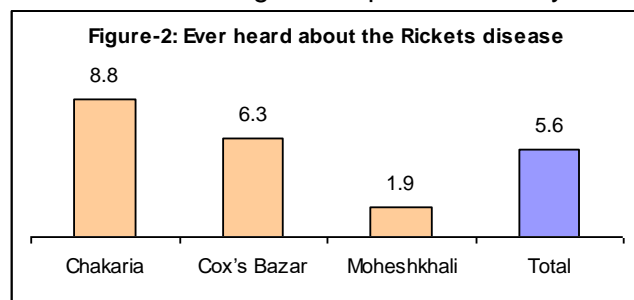
### 3.4 Diseases usually suffered by the children and Sources of treatment:

The source of this information is the FGDs conducted under the study. Usual diseases suffered by the children, as mentioned by the participants were ranked. It shows that cold, cough, breathing problem and pneumonia are the major diseases suffered by the children. Other diseases mentioned frequently are fever, diarrhea, vomiting, jaundice and skin disease.

The sick children are treated both in the govt. hospitals and private qualified and, unqualified (Palli Chikitshak). The choice is mixed and depends upon the availability of govt. facility near by. In more than one group the participants argued that they go to private doctors because the govt. hospital do not give proper treatment and ultimately they need to go to private doctor. So, they go direct to private doctor. However, it was gathered that the poor households tend to choose the govt. hospital, as the treatment is expensive in private facility specially the doctor fees.

### 3.5 Awareness about Rickets

“Rickets” as the name of a disease was almost unknown among the respondents. Only 5-6% of the respondents, mostly from Chakaria and Cox’s Bazar sadar, reportedly heard the name of the disease. Further questions were asked about ‘Rickets’ naturally to those who reportedly heard about the disease. The questions included: a) Whether seen any Rickets patient b) Reasons for having the disease c) Knowledge about preventive measures, d) Possible source of treatment e) Source of knowledge about Rickets etc. As only 27 respondents (5.6%) were eligible to ask these questions, the distribution of the respondents by upazila and the various responses they made do not seem to be worth discussing. Interested readers may see the same at (*Annex-1*). However, the responses reveal that most of the respondents aware of Rickets have seen a patient but they hardly know about the specific reason of calcium deficiency for the disease. It was also gathered that 3 out of these 27 households had a rickets patient in their households. These children were between 6 and 15 years.

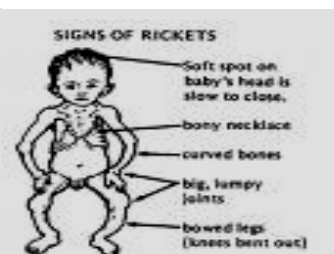


**FGD Findings:** In the six FGDs conducted, except one participant from Chakaria, none was aware of ‘Rickets’ as a disease. None of the participant’s body also knew about any organization working for the disables.

### 3.6 Observed Symptoms of Rickets among Young Children

For each of the children aged from 6 months to 5 years in the survey households, information was collected on the following **seven** symptoms:

1. Age is less than 5 years.
2. The height & weight is below average
3. The wrist joint is increased
4. Feels pain at the leg while walking
5. The ribs of the chest are raised
6. Both legs are little curved
7. The legs are curved from knee to ankle



Reportedly it has been established by **Dr.Theirry Craviarre of AMD with the support of SARPV** through their long experience and detail observation that a child showing at least three of the five bodily symptoms could be primarily diagnosed as a suspected ‘Rickets’ patient and he/she should be given immediate supplementary food and other recommended

treatment to recover from the disease.

The result of the observed five symptoms of the children between 6 months and 5 years are presented in the table below. It may be observed that overall 7.4% (51 in number) of children showed at least three bodily symptoms to suspect that they are Rickets affected. Such proportion is the highest in Moheshkhali (9.2%) and the lowest in Chakaria (5.4%). It may also be observed that individual symptoms vary a lot among the upazilas except 'leg pain'.

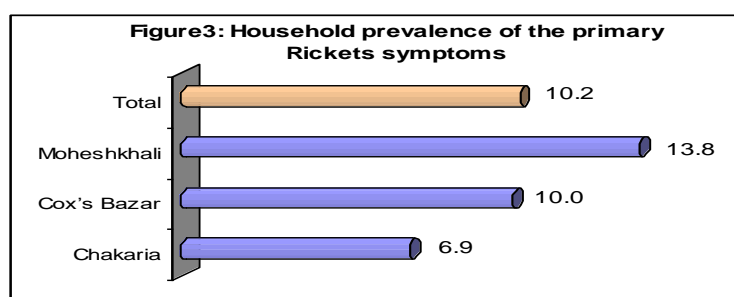
**Table-3.3:** Symptoms relating to Rickets among the children aged 6 months to 5 years

Symptoms	Chakaria	Cox's Bazar	Moheshkhali	Total
1. The height is below average	26.0	8.4	10.0	14.7
2. The wrist joint is increased	0.4	6.6	5.8	4.4
3. Feels pain at the leg while walking	7.6	7.1	7.9	7.5
4. The ribs of the chest are raised	10.3	5.8	12.5	9.6
5. The legs are curved from knee to ankle	13.5	9.3	15.8	12.9
<b>N = Total Children</b>	<b>223</b>	<b>226</b>	<b>240</b>	<b>689</b>
Showed at least 1 symptom	<b>36.3</b>	<b>13.3</b>	<b>25.8</b>	<b>25.1</b>
Showed at least 2 symptoms	<b>14.3</b>	<b>9.3</b>	<b>13.8</b>	<b>12.5</b>
Showed at least 3 symptoms	<b>5.4</b>	<b>7.5</b>	<b>9.2</b>	<b>7.4</b>
<b>Avg. Age of child (years)</b>	<b>2.89</b>	<b>2.93</b>	<b>2.92</b>	<b>2.92</b>
<b>Avg. child per HH</b>	<b>1.5</b>	<b>1.4</b>	<b>1.4</b>	<b>1.4</b>

**FGD Findings:** While the rickets like symptom were discussed and asked whether the children of their communities showed such symptom, many of them said that they did. Higher mention came from two FGDs of Chakaria and one from each of Cox's Bazar and Moheshkhali.

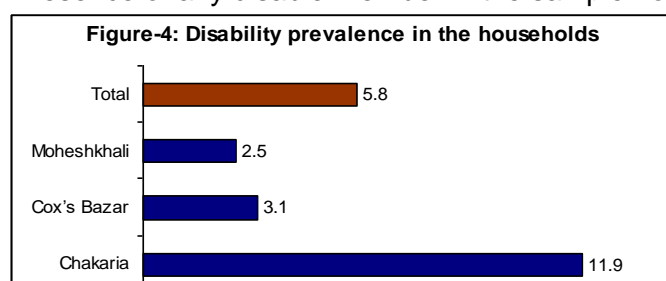
### 3.7 Prevalence of Rickets or Rickets-like symptoms in the Households

When the 51 suspected Rickets cases of children 6 months to 5 years are seen in respect of the households it is observed that they fall into 10.2% of the households (i.e., 49 out of the 480). We may call this as household prevalence of the primary Rickets symptoms in the sense that at least one child in these households showed such level of symptoms in children. The Figure-3 shows the trend.



### 3.8 Disability prevalence

Presence of any disable member in the sample households was reported by 5.8% occasions (29 households). Most of them were in Chakaria (19 households, 11.9%) and they were mostly physically disable (63%). Other type of disability (like

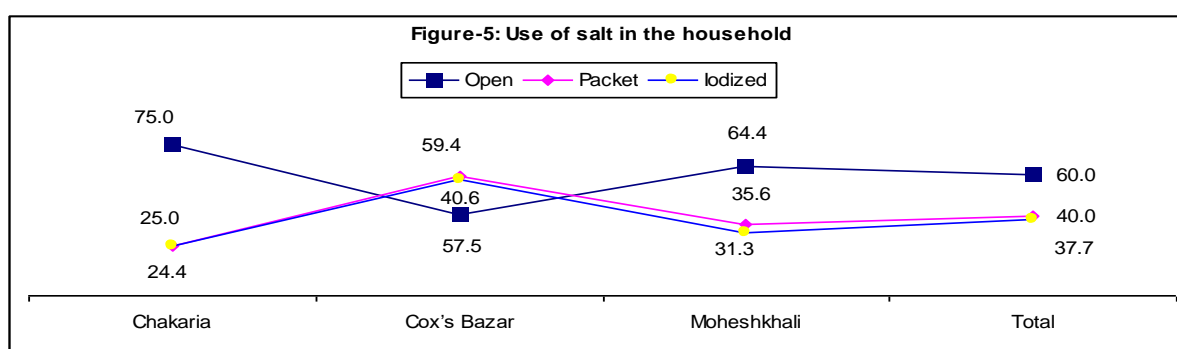


physiological, blindness, deaf & dumb) was found one each in all the three upazilas.

**FGD Findings:** Except in one FGD (Fashiakhali of Chakaria), in all the FGDs a few of the participants told that physically disable persons existed in their community. Such mention was significantly higher in Moheshkhali Sadar. This is opposite to the survey results. May be this is the reason for small number of FGD.

### 3.9 Use of iodized salt

Majority (60%) of the respondent households use open salt with highest proportion (75%) in Chakaria. On the other hand majority (59%) of the households from Cox's Bazar used packet salt. The salt samples from the packet were tested for iodine. Of the packet salt users (40%) in which the salts were tested, 37.7% were found iodized.



In another investigation, about 28 percent of the all respondents knew that goiter is caused due to lack of iodized salt. Highest 39% of the respondents from Cox's Bazar knew this as against 21% from Chakaria. This knowledge varied among the upazilas and was related to the use of packet salt.

**FGD Findings:** Except a few participants in Rakhain Para of Cox's Bazar Sadar and Moheshkhali Sadar, the most of the FGD participants told that they used open salt (not packed or branded). These participants were also not much aware about whether the salt they used were iodized or not. Most of them were also found ignorant about the consequence of iodine deficiency, although one or two women in each FGD could tell that.

### 3.10 Food habit

The respondents were asked how many days a week vegetables are eaten in their houses. The result is presented the table below

Table-3.4: Number of days a week vegetables are cooked in the households. by upazila.

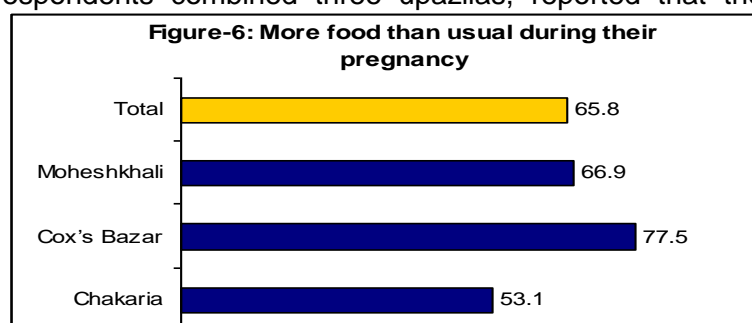
Number of days	Chakaria	Cox's Bazar	Moheshkhali	Total
Every day (7 days a week)	17.5	8.1	38.8	21.5
Weekly 5-6 days	23.8	41.3	11.9	25.6
Weekly 3-4 days	34.4	42.5	27.5	34.8
Weekly 1-2 days	24.4	8.1	21.9	18.1

<b>N = All HHs</b>	<b>160</b>	<b>160</b>	<b>160</b>	<b>480</b>
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About a half of the mothers told that they give vegetables five days a week or more. Vegetables are claimed to be eaten more number days in Cox's Bazar and Moheshkhali than Chakaria. While asked whether the children less than 5 years are given selected vegetables and small fish (*Dheros, Lal shak, Kochu shak and Choto mach*), more than 90 percent of the mothers answered in affirmative.

### 3.11 Food Habit for pregnant mother

About two-thirds (66%) of the respondents combined three upazilas, reported that the pregnant women take (or given) more food than usual during their pregnancy. This was found the highest (78%) in Cox's Bazar and the lowest (53%) in Chakaria. The following graph shows the same.



### 3.12 Exclusive breast feeding

The modal value of the response on the duration of exclusive breast feeding was 6 months reported by 62% of the respondents, with little difference among the upazilas. However, highest 29% of the mothers in Moheshkhali upazila exclusively breastfed their last child for less than 6 months. This is to mention that the recommended age for exclusively breastfeeding is 6 months.

Table-3.5 : Exclusive breast feeding by upazila.

Indicator	Chakaria	Cox's Bazar	Moheshkhali	Total
Less than 6 months	12.5	13.8	28.8	18.3
6 month	63.8	65.0	58.1	62.3
7 months or above	23.8	21.3	13.1	19.4
<b>N = All HHs</b>	<b>160</b>	<b>160</b>	<b>160</b>	<b>480</b>

### 3.13 Use of safe drinking water

More than 95% of the households use tube well water as the main source of drinking. This is because the main source is tube well and the alternate source is also tube well often of the same type at a distance.

**FGD Findings:** The participating mothers were aware of safe water and all of them were using TW water except in one (Rakhain Para of Cox's Bazar Sadar) who used piped water for drinking. However, in 3 FGDs in Chakaria and Moheshkhali problem about availability of tube well water was mentioned by many during dry season. They suggest DTW as the

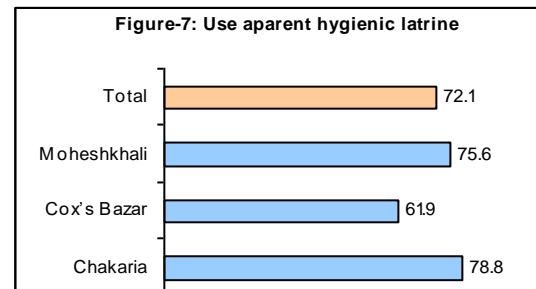
solution to the problem.

### 3.14 Latrine use and sanitation

Majority (72%) of the households used apparently hygienic latrine represented by Pucca sanitary or Ring-slab. Such latrines are used more in Cox's Bazar.

FGD Findings: It was disappointing to know from the discussion that the large majority of the household use open or unhygienic latrine in which feces are let open to go to streams or low lying

areas. Reportedly most of the participants used Ring Slab latrine with broken gooseneck and open well/ chamber to turn it unhygienic. Many of the participants also did not know what makes a latrine hygienic. Others described it as sanitary or ring slab. Use of hygienic latrine was reported higher in Cox's Bazar Sadar FGDs consistent with the survey findings.





## Chapter Four

### Discussion on Findings and Conclusion

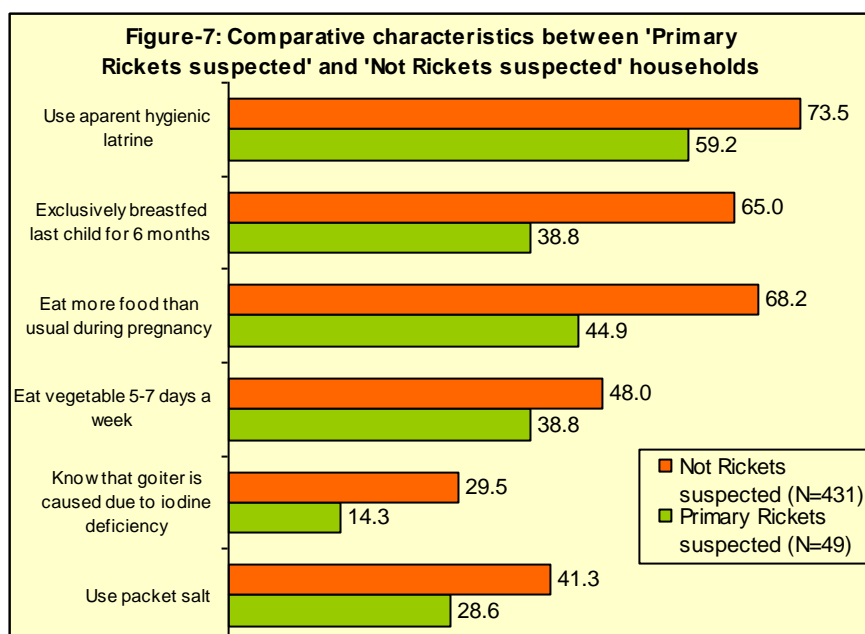
#### 4.1 Discussion of Findings

Although the study covered many different aspects related to Rickets and disability, we discuss some selected issues based on the finding to draw our conclusions and make recommendations.

It is established from the survey and the FGDs that even simple awareness of Rickets as a disease is very low in the project area (only 5.6%) and definite knowledge about the disease like the root cause for the same (i.e., calcium deficiency) is almost non-existent. So we are left with the discussion on the findings as regards five symptoms of the disease among the children.

Let us remember that we had surveyed among the lower socio-economic segments of the population, which has been established in the background characteristics of the households and the heads of the households presented in the preceding chapter. Table-3.3 of the chapter also shows that at least three symptoms (out of five symptoms investigated) to suspect Rickets were found among 7.4 percent of the children from 6 months to 5 years. In terms of number, 51 out of 668 children of the said age showed at least three symptoms meaning that they are suspected to be Rickets affected. It has also been found that household prevalence of the 'Rickets like symptoms' was 10.2%. In other words 49 out of 480 households had any child showing at least three primary symptoms of Rickets.

**Profile of households with children showing symptoms of Rickets:** In order to examine whether children showing 'Rickets like symptoms' come from the same background of those not showing at least three symptoms of Rickets, we have tabulated the selected socio-economic and behavioural variables by 'Showing three symptoms' and 'Not showing'. The summary of the findings have been



presented as Figure-7. Although the number of children in the 'Showing three symptoms'

group is much less than the other group and making it less reliable to compare, the highlights of the findings may be noticed for indicative results. It shows that: 1) There is no much of difference between the two groups as regards household income, 2) Use of iodized/packet salt is significantly higher in the 'Not showing' group, 3) This group is also more knowledgeable about the fact that iodine deficiency causes goitre. 4) They took vegetables more number of days in a week than the 'Showing three symptoms' group, 5) Exclusive breast feeding is continued for significantly longer period by the 'Not showing symptom' group etc.

**Use of iodized salt:** Although the relation between iodine deficiency and Rickets is not established yet, still the fact that the majority (60%) of the sample households are using open and non-iodized salt specially in Chakaria (75%) calls for attention of the health and nutrition service providers of the region.

**Safe drinking water and sanitation:** There have been a lot of activities in recent years towards achieving 'hundred percent sanitation' by 2010 or even before. We all know that use of hygienic latrine is only the first step towards the sanitation goal. While the survey showed 72 percent of the households are using hygienic latrine, further investigation through FGD and otherwise proved that the feces are not confined in most of the latrines making them unhygienic. Although people are quite conscious about drinking safe water, lack of sanitation and hygiene practices has its toll on the health and well being of the people and the children in particular. The already deficient nutrition of the children is likely to aggravate if the children are attacked with diarrhoea and other water borne and easy to contaminate diseases.

## 4.2 Conclusion

Based on the brief discussion above and also the survey findings presented in the preceding chapter, we can conclude that there is risk of the spread of calcium deficient deformities (Rickets) in children in the project area due to ignorance of the people and lack of attention of the government health system about the matter. The fact that the risk of Rickets is seen to vary by region within the project area and also among households with varying food practices, suggests that there is much scope of work on the issue. There is also scope of working together with other health and nutrition sector programs to reduce the risk of rickets in the project area, which could also be extended nationwide.

## 4.3 Recommendation

Although this is a baseline and making any recommendation is not mandatory, we outline below a few recommendations with necessary rationales, for the project implementers and also for those who sponsor such projects:

1. People know about malnutrition and its consequences but not Rickets. Rickets awareness program, therefore, should be integrated with nutrition promotion program

for better comprehension and understanding of the people.

2. Lack of sanitation aggravates the already deficient nutritional status of the poor and specially in young children. So, the sanitation campaign should be run simultaneously.
3. In order to ensure higher availability of food in the poor households, the project could take up income supplementation program side by side of the Rickets/nutrition promotion campaign.
4. As because primary school enrollment is very high in the project area, the primary school teachers should be trained about Rickets so that they can discuss this in their regular health classes.
5. The unqualified rural medical practitioners (RMP) or *Palli Chikitshak* (PC) are largely visited by the poor for treatment at low cost. They may be trained on Rickets and its protection/ remedy to reach the knowledge quickly to remote rural areas and as reminder.
6. In similar fashion, the imams of the mosques and priests of other religions should also be trained on Rickets and encourage them to disseminate the messages to the common people at suitable opportunity.
7. Mixing lime (*chun*) with rice during/after cooking as a calcium supplementation to the Rickets suspected families is a new message and its acceptability and practice have to be tested and monitored before it is widely promoted. Use of '*Pisha til*' seems more easy to put into use. This is also subject to test due to relative non-availability of the product (*til*) in all the houses.
8. Although mothers should be the main target for the Rickets awareness program, the males should also be reached with the messages because they usually buy/ collect the food items for the family.
9. The suspected Rickets cases should be medically examined to establish the degree of reliability of the symptom based suspicion. SERPV could take up a study on this.

## Annex-1

**Complete Set of table**

	Chakaria	Cox's Bazar	Moheshkhali	Total
<b>Number of Respondent</b>	<b>160</b>	<b>160</b>	<b>160</b>	<b>480</b>
<b>Sex of the head of household</b>				
Male	96.3	97.5	100.0	97.9
Female	3.8	2.5	-	2.1
<b>Age of the head of household</b>				
Less than 30 years	44.4	42.5	40.6	42.5
31-40 years	41.9	44.4	46.9	44.4
41-50 years	10.6	9.4	11.3	10.4
50+ years	3.1	3.8	1.3	2.7
Avg. age (in years)	34.1	34.7	34.5	34.4
<b>Occupation of the head of household</b>				
1 Day labour	15.6	55.6	33.8	35.0
2 Agriculture	31.9	4.4	6.9	14.4
3 Rickshaw/Van puller/ Boatman	11.9	0.6	10.6	7.7
4 Service	3.1	13.8	5.6	7.5
5 Business/ soap owner	19.4	20.0	19.4	19.6
6 Skilled labour	4.4	0.6	5.6	3.5
7 Driver	3.1	3.1	1.3	2.5
8 Teacher/professor	1.9	-	-	0.6
9 Fishermen	6.9	-	15.0	7.3
10 Bigger	0.6	-	-	0.2
11 Living abroad	1.3	1.3	1.3	1.3
12 Unemployed	-	0.6	0.6	0.4
<b>Income of the household</b>				
Less than Tk. 2000	11.9	12.5	6.3	10.2
Tk. 2001-3000	50.0	45.6	69.4	55.0
Tk. 3001-5000	30.6	29.4	18.1	26.0
Tk. 5001-10000	6.3	11.9	5.6	7.9
10000 +	1.3	0.6	0.6	0.8
Avg. income (in Taka)	3638	3760	3486	3628
<b>Sex of the respondent</b>				
Male	9.4	0.6	3.1	4.4
Female	90.6	99.4	96.9	95.6
<b>Relation of the respondent with HHH</b>				
Self	22.5	1.9	8.1	10.8
Spouse	74.4	96.9	88.1	86.5
Others	3.1	1.3	3.8	2.7
<b># of 6-15 years child stay in HH</b>				
6 month to 5 years	232	228	242	702
5 + years	210	195	195	600
Total # of child (age 6-15)	442	423	437	1302

	Chakaria	Cox's Bazar	Moheshkhali	Total
Avg. age of the child (age 6 month-5 years)	1.5	1.4	1.5	1.5
Avg. age of the child (age 6-15)	2.1	2.0	2.0	2.0
Sex of the child				
Boy	50.2	51.8	51.0	51.0
Girl	49.8	48.2	49.0	49.0
Age gap between last child to 2 <sup>nd</sup> last child	3.4	3.5	2.9	3.3
Identification of child				
At lest 3 symptom	6.9	10.0	13.8	10.2
At lest 2 symptom	18.1	12.5	18.8	16.5
At lest 1 symptom	46.3	17.5	34.4	32.7
Ever heard about the Rickets disease				
Yes	8.8	6.3	1.9	5.6
No	91.3	93.8	98.1	94.4
Ever seen of Rickets disease				
Yes	92.9	90.0	66.7	88.9
No	7.1	10.0	33.3	11.1
N=Ever hard of Rickets	<b>14</b>	<b>10</b>	<b>3</b>	<b>27</b>
Where a 'Rickets' victim child could be treated?				
Govt. Hospital	35.7	90.0	66.7	59.3
NGO clinic	50.0	10.0	33.3	33.3
Others	14.3			7.4
Do you know the reasons for which a child may get 'Rickets'? If yes, please tell how?				
Not giving calcium rich food	-	50.0	-	18.5
Not giving nutritious food	14.3	10.0	33.3	14.8
Others	21.4	-	-	11.1
Don't know	64.3	40.0	66.7	55.6
Do you know what should be done to protect children from 'Rickets'?				
To give calcium rich food	-	40.0	-	14.8
To give nutritious food	14.3	10.0	33.3	14.8
Others	28.6		33.3	18.5
Don't know	57.1	50.0	33.3	51.9
Do you know how a Rickets affected child can be recovered?				
Taking calcium rich food	-	30.0	-	11.1
By treating medically	7.1	40.0	-	18.5
By giving nutritious food	7.1	10.0	33.3	11.1
Others	7.1	-	-	3.7
Don't know	78.6	20.0	66.7	55.6
Where have you learnt about treatment and prevention of Rickets?				
TV	-	30.0	-	11.1

	Chakaria	Cox's Bazar	Moheshkhali	Total
Radio	7.1	40.0	-	18.5
Poster	7.1	10.0	33.3	11.1
Relative/Friend	7.1	-	-	3.7
Others	78.6	20.0	66.7	55.6
<b>Is there any Rickets patient in your house?</b>				
Yes	14.3	10.0	-	11.1
No	85.7	90.0	100.0	88.9
If yes, How many of them in age group 6-15 years and More than 15 years?				
6-15 years age child	-	1	1	2
15 + years age child	-	-	1	1
Is there any other disable member in the household other than a Rickets affected ?				
Yes	11.9	3.1	2.5	5.8
No	88.1	96.9	97.5	94.2
<b>Total # of disable member</b>	<b>19</b>	<b>5</b>	<b>5</b>	<b>29</b>
Avg. age of disable member (in year)	10.8	11.2	38.8	14.9
Type of disability				
Physical	63.2	20.0		46.4
Mental	5.3	20.0	50.0	14.3
Blind	5.3	40.0	-	10.7
Dumb	5.3	-	50.0	10.7
Mute	15.8	20.0	-	14.3
Others	5.3	-	-	3.6
<b>All Respondent</b>				
Which kind of salt you use in the kitchen? Open or packaged?				
Open	75.0	40.6	64.4	60.0
Packet	25.0	59.4	35.6	40.0
Is the salt used iodized?				
Yes	24.4	57.5	31.3	37.7
No	75.6	42.5	68.8	62.3
Do you know the name of disease(s) caused due to iodine deficiency? Please tell.				
Goiter	20.6	39.4	23.8	27.9
Intellectual disability	0.6	1.3	-	0.6
Rickets	.6	-	-	0.2
Others	9.4	1.9	5.6	5.6
Don't know	68.8	57.5	70.6	65.6
Do you mix/ eat lime ( <i>chun</i> ) or chushed tilseed ( <i>Pisha til</i> ) with rice ?				
Yes	1.9	-	1.3	1.0
No	98.1	100.0	98.8	99.0
How many days a week do you eat green/ leafy vegetables in your house?				

	Chakaria	Cox's Bazar	Moheshkhali	Total
Every day weekly 7 days	17.5	8.1	38.8	21.5
Weekly 5/6 days	23.8	41.3	11.9	25.6
Weekly 3/4 days	34.4	42.5	27.5	34.8
Weekly 1/2 days	24.4	8.1	21.9	18.1
Do the pregnant mothers eat more food than they eat at normal times?				
Yes	53.1	77.5	66.9	65.8
No	46.9	22.5	33.1	34.2
How long the youngest child has been on exclusive breast feeding?				
Less than 6 months	12.5	13.8	28.8	18.3
6 month	63.8	65.0	58.1	62.3
7 and above months	23.8	21.3	13.1	19.4
Avg. months	6.1	6.3	5.4	5.9
Do you give your 6 months to 5 years child <i>Dheros, Lal shak, Kochu shak or Choto mach?</i>				
Yes	90.6	92.5	91.9	91.7
No	9.4	7.5	8.1	8.3
Do you use hygienic latrine in the house?				
Yes	78.8	61.9	75.6	72.1
No	21.3	38.1	24.4	27.9
Do you have proper arrangement for drinking safe water in the household?				
Yes	98.1	99.4	98.8	98.8
No	1.9	.6	1.3	1.3

## Annex-2

ID #

**SARPV-Bangladesh and UNICEF**  
**Prevention of Rickets through Nutrition in Cox's Bazar District**  
**Questionnaire**

District : Cox's Bazar	Code	<b>Head of Household Information</b>	
Upazlia : .....	1	Name : .....	
Union : .....	<input type="text"/>	Sex : Male-1 Female-2	
Ward : .....	<input type="text"/>	Age : ..... year	
Village : .....	<input type="text"/>	Occupation : .....	
		Household monthly income : ..... (Taka)	
		Name of respondent : .....	
		Sex : Male-1 Female-2	
		Relationship with Head of HH: Self-1, Spouse-2, Others-3	

## 1. 6 months -15 years age child information of HH

Sl. #	Name	Age	Sex 1-Boy, 2-Girl	*Relation with head of household
1				
2				
3				
4				
5				

\*Relation code: Son/Daughter-1, -2, -3, Brother/Sister-4, Others-5

## 2. Fill out the following table for those children (if any) aged between 6 months and 5 years average

Information	SL# .....	SL# .....	SL# .....
	(Yes-1, No-2)	(Yes-1, No-2)	(Yes-1, No-2)
2.1 The height is below average			
2.2 The wrist joint is increased			
2.3 Feels pain at the leg while walking			
2.4 The ribs of the chest are raised			
2.5 The legs are curved from knee to ankle			

Question	Answer	Code	Skip
3. Have you ever heard about a disease named 'Rickets'?	Yes	1	
	No	2	13
4. Have you ever seen a "Rickets" patient?	Yes	1	
	No	2	
5. Do you think 'Rickets' patient can be cured through treatment?	Yes	1	
	No	2	
	Don't know	3	
6. Where a 'Rickets' victim child could be treated?	Govt. Hospital	1	
	MBBS Doctor/ Private clinic	2	
	NGO clinic	3	
	Homiopathy	4	
	RMP/ Village doctor	5	
7. Do you know the reasons for which a child may get 'Rickets'? If yes, please tell how ?	Not giving calcium rich food	1	
	Not giving nutritious food	2	
	Other (specify) .....		
	Don't know	9	



Question	Answer	Code	Skip
8. Do you know what should be done to protect children from 'Rickets'? If yes, please tell what to do?	To give calcium rich food	1	
	To give nutritious food	2	
	Other (specify) .....		
	Don't know	9	
9. Do you know how a Rickets affected child can be recovered? If yes, please tell me how?	Taking calcium rich food	1	
	By treating medically	2	
	By giving nutritious food	3	
	It cures naturally	4	
	Other (specify) .....		
	Don't know	9	
10. Where have you learnt about treatment and prevention of Rickets?	TV	1	
	Radio	2	
	Poster/Liflet	3	
	Relative/ Friend	4	
	Neighbour	5	
11. Is there any Rickets patient I your house?	Yes	1	
	No	2	
12. If yes, How many of them in age group 6-15 years and More than 15 years?	6-15 years age child	.....	
	15 + years age child	.....	
13. Is there any other disable member in the household other than a Rickets affected ?	Yes	1	
	No	2	→ 15
14. If there is a disable member in the HH, please write the name age and type of disability of each.			
	*Code: Physical-1, Mental-2, Blind-3, Dumb-4, Mute-5, Others-6		
15. Which kind of salt you use in the kitchen? Open or packaged?	Open salt	1	
	Packet salt	2	
16. Is the salt used iodized? [ FI: Examine and write the result ].	Yes	1	
	No	2	
17. Do you know the name of disease(s) caused due to iodine deficiency? Please tell.	Goiter	1	
	Intellectual disability	2	
	Rickets	3	
	Other (specify) .....		
	Don't know	9	
18. Do you mix/ eat lime ( <i>chun</i> ) or chushed tilseed ( <i>Pisha til</i> ) with rice ?	Yes	1	
	No	2	
19. How many days a week do you eat green/ leafy vegetables in your house?	Every day (7 days a week)	1	
	Weekly 5-6 days	2	
	Weekly 3-4 days	3	
	Weekly 1-2 days	4	
20. Do the pregnant mothers eat more food than they eat at normal times?	Yes	1	
	No	2	
21. How long the youngest child has been on exclusive breast feeding?	Months	.....	
22. Do you give your 6 months to 5 years child <i>Dheros, Lal shak, Kochu shak or Choto mach</i> ?	Yes	1	
	No	2	
23. Do you use hygienic latrine in the house?	Yes	1	
	No	2	
24. Do you have proper arrangement for drinking safe water in the household?	Yes	1	
	No	2	

Very very thanks

Name of Interviewer: ..... Date : .....

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Survey Conducted by: **Pathways Consulting Services Ltd.** 3/12 Block-F, Lalmatia, Dhaka-1207, Ph-8150141