Report on
Prevention of Rickets through Nutrition Project
2008 - 2010

Implemented by

Social Assistance and Rehabilitation for the Physically Vulnerable (SARPV), Bangladesh

Supported by

unicef

Prevention of Rickets through Nutrition Project

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1. Foreword

Social Assistance and Rehabilitation for Physically Vulnerable (SARPV) Bangladesh is an advocating organization in the development arena. It has been working since 1989 to develop a society where persons with disabilities can enjoy their rights and opportunities as parts of the mainstream. Working on this issue SARPV Bangladesh has been trying to see the association between rickets and disability. Rickets was first brought before public attention in 1991 by SARPV personnel after visiting Chakaria Upazila where approximately 1% children had rachitic deformities. Initial studies suggested that Vitamin D deficiency was not the major cause of rickets in Bangladesh and calcium deficiency is assumed to be the etiological factor.

Rickets is preventable and curable if identified and treated at an early stage If detected at an early stage of deformities only nutritional advice and medicine can suffice. For more than 20 degrees of leg deformity, surgery or brace is used as needed. It is more important to raise mass awareness on rickets.

As SARPV Bangladesh dreams of a “Rickets-free Bangladesh”, it has undertaken “Prevention of Rickets through Nutrition Project” under its disability prevention program, with the assistance from UNICEF and AMD - Aide Medicale et Developpement, France (Medical and Development Aid), to materialize the dream. This is a pilot project with the aim of having rickets-free Cox's Bazar Sadar, Maheskhali and Chakaria Upazilas in Cox's Bazar district and increasing the use of iodized salt. The project duration is 3 years (2008 - 2010). Now the project is in its second phase.

This is the second time UNICEF has come forward to take an initiative to support the rickets prevention program through nutrition and raising awareness.

SARPV Bangladesh is trying to address the issue keeping a child-centered approach in mind. The children are the victims of this disease and if we do not take care of them at the right time, then rickets will turn it into disability.

Notable activities of the project include identifying ricketic signs among children below 5 years, educating mothers of rickets-affected children to form groups, encouraging to have calcium-rich vegetable, cooking rice with lime (chun) @1 mg chun in 1 kilo rice, and providing physiotherapy and assistive device.

The project is the result of help and co-operation of many. We would be failing our duties if their cooperation and valuable contributions are not mentioned and acknowledged.

First of all, the contribution of the children with Rickets and their families who accepted our nutritional intervention with a positive attitude deserve to be acknowledged.

Thanks are also due to the project team who diligently worked in the project areas and my colleagues at the head office of SARPV for their co-ordination and interaction with the donor, project team and the partners of SARPV, Media and all other stakeholders.

The officials of the government, NGOs and DPOs deserve appreciation and thanks for becoming sensitized on the issue of Rickets and being supportive to our activities to that end.

Last but not the least, UNICEF Bangladesh and AMD, France deserve special appreciation not only for taking active interest and enthusiastically coming forward to support the initiative to prevent rickets and to reduce the disability from the society, but also for extending guidance and moral support from time to time.

SARPV remains deeply appreciative of its members, funders, volunteers, and partners for their supports, without whom it would be, no doubt, absolutely impossible for SARPV to come upto this level.

Md. Shahidul Haque
Chief Executive
SARPV Bangladesh

2. Abbreviations & Acronyms

AEM	Ami des Enfants du Monde (AEM), France (Friends of the Children of the World)
AMD	Aide Medicale et Developpement, France (Medical and Development Aid)
BMA	Bangladesh Medical Association
CBBSH	Cox's Bazar Baitush Sharaf Hospital
CIMMYT	Centro Internacional de Mejoramiento de Maíz y Trigo (International Maize and Wheat Improvement Center)
CRG	Convergence Rickets Group
DFID	Department for International Development, UK
DPO	Disable Person's Organization
FGD	Focus group discussion
HKI	Helen Keller International
ICMH	Institute of Child and Maternal Health
KDM	Kinesitherapeute du Monde, France (Physiotherapists of the World)
MCH	Memorial Christian Hospital
NGO	Non Government Organization
NNP	National Nutrition Project
PCSL	Pathways Consulting Services Limited
SARPV	Social Assistance and Rehabilitation for the Physically Vulnerable
USAID	United States Agency for International Development

3. Brief on Rickets in Bangladesh

PREVALENCE OF RICKETS IN BANGLADESH.....

Focus groups and local informants suggested that rickets was 'new' and had not been seen before the early 1970s. In 1991 SARVP brought national attention about the prevalence of Rickets in Chakaria under Cox's Bazar district. In 1994, a group of French physicians evaluated patients in communities from Chittagong to Moheshkhali and identified rickets in 4.5% of total children under 15 years old. Later it was revealed by experts that rickets was more common than suspected and it was not generally associated with vitamin D deficiency but related to dietary insufficiency of calcium.

The Institute of Child and Mother Health (ICMH) found in a survey in Chittagong division in 1998 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.

Helen Keller International (HKI) found the highest prevalence (1.4%) of visible rachitic deformities in 1-15 year old children in the Cox's Bazar upazila in a nationwide survey in 2004.

SARPV found rickets in 0.9% of the total population surveyed in 2006 in Chakaria upazila. Interestingly, rickets has not been identified among the indigenous population living in the Chittagong Hill Tracts.

The National Rickets Survey in Bangladesh, done in 2008, was the largest initiation to screen, diagnose, and estimate the prevalence of childhood rickets in Bangladesh. A preliminary study observed that all rickets in Bangladesh may not be due to Vitamin D deficiency, and that calcium metabolism was an important cause, which may be much easier to prevent. This survey was conducted by the co-investigators collaboratively. The collaborators are (i) CARE Bangladesh (ii) UNICEF (iii) Government represented by NNP (National Nutrition Program) (iv) SARPV and (v) ICDDR,B. SARPV, because of its extensive experience in diagnosis and treatment of calcium deficient rickets in children was involved in project development. The national survey showed the prevalence of rickets to be 0.99% in children of 1-15 years. In Chittagong division, Chittagong and Cox's Bazar districts had the highest prevalence. In Cox's Bazar district, Chakaria, Maheskhali and Cox's Bazar Sadar Upazila were highly endemic for rickets.

In 2010, SARPV Bangladesh conducted a baseline survey in Cox's Bazar, Gazipur and Sunamganj districts with supports from DFID and Healthlink Worldwide, UK, which showed that Gazipur has the highest prevalence of rickets (1.9%) among all the districts of Bangladesh.

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.

TREATMENT OF RICKETS IN BANGLADESH.....

From 2001 to 2007 Aide Médicale et Development (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. Only 17%, who have greater leg deformities, need medical treatment. Bracing or surgery is needed only for 6% of children with rickets.

4. Chronology of Rickets in Bangladesh

1991 : **I**dentification of a high prevalence of rickets in the children of Chakaria in Cox's Bazar district by Md. Shahidul Haque, Founder Secy, SARPV after the devastating cyclone.

1991-1993 : **S**ARPV raised campaigns through Newspapers, Dialogue forum, Letter correspondences, Annual reports and Workshops

SARPV treated 25 rachitic children at MCH

1993-1997 : **N**utritional survey on clinical and pathological examination of rachitic children by Ami des Enfants du Monde (AEM), France

Rapid prevalence-assessment by ICMH, UNICEF and SARPV.

1994 : **D**iagnosed as calcium deficiency rickets by Dr Cimma of AEM, France

1995 : **S**upplementation trial using different Calcium & Vitamin D doses by AEM (Dr J.P. Cimma)

1997 : **T**wo Bangladeshi boys were operated in France (AEM)

Formation of a Consortium on rickets in Chakaria, Bangladesh by SARPV, Cornell University, BRAC, ICDDRB, AEM, MCH, UNICEF, and ICMH

1998 : **C**onfirmation by the consortium - the rickets in Bangladesh is a Calcium deficient form.

Rachitic children clinically and pathologically examined by Cornell University, University of Dhaka, SARPV and MCH

Supplementation trial of Calcium on 2-5 years old children by Cornell University, CIMMYT and SARPV

Household Study on Food habit of the inhabitants of Cox's Bazar and Dinajpur districts by Cornell University

1999: **P**rodipaloy (an integrated school) was set up to supervise control children under rickets research by AEM, France

Physiotherapy training started for community level physiotherapists by KDM, France

2000: **R**apid Assessment on Rickets by BRAC and HKI under Rickets Consortium

2001 : **T**raining of Bangladeshi physiotherapists starts with 4 trainees by KDM jointly with SARPV and AMD.

2001-2003: **S**tudy on the role of Aluminium dishes on rickets by Shahidul Association.

2002 : **S**urgery begins at Cox's Bazar Baitush Sharaf Hospital (CBBSH) in collaboration with AMD, KDM, SARPV.

2003: **B**race center at Chakaria with support from AMD, France

200 children given nutritional treatment under close supervision

2004: **C**RG (Convergence Rickets Group) formed under the leadership of Dr. Craviari Thierry for concentrating and involving more expertise on rickets and sharing experiences.

2005: **O**peration of 128 Ricketic children in Bangladesh initiated by SARPV with the help from AMD, France and KDM, France under the supervision of Dr. Craviari Thierry

2006: **I**nternational Rickets Conference held at Dhaka, Bangladesh organized by SARPV with participation from USA, Nigeria, South Africa and France inaugurated by the French Ambassador to Bangladesh and the President of BMA.

2007: **R**ickets Interest Group (RIG) formed as a follow up of International Rickets Conference

Dr. Thierry proposes formation of Bangladesh Rickets Society.

2008: **P**revention of the Rickets program undertaken at Cox's Bazar district with the assistance from UNICEF.

National Prevalence Study on Rickets by ICDDR,B with supports from SARPV, CARE, UNICEF and NNP

National Consultation on Childhood Rickets in Bangladesh organized by SARPV Bangladesh and RIG with supports from UNICEF.

2009: **F**inding of National Prevalence Study on Rickets: 1% of the population below 15 yrs is suffering from Rickets .

2010: **S**ARPV Bangladesh conducts a baseline survey in Cox's Bazar, Gazipur and Sunamganj districts with supports from DFID and Healthlink Worldwide, UK.

Finding of baseline survey: Gazipur has the highest prevalence of Rickets (1.9%) among all the districts of Bangladesh.

5. Project Brief

PROJECT

Prevention of Rickets through Nutrition Project

VISION

Rickets-free Bangladesh

MISSION

Rickets-free Cox's Bazar

OBJECTIVES

- To raise awareness of the population of the three upazilas on various aspects of Rickets including prevention of childhood Rickets through dietary intake and referral services to special facilities for the Rickets affected children.

- To establish a benchmark, through a baseline survey, in the three project upazilas in identifying and describing the present status of knowledge and attitude about Rickets and related practices, and also of use of iodized salts.

AIMS

- At least 50% of households are aware of rickets in children, its early signs and consequences in terms of disability, its prevention through improved calcium dietary intake, and where to go for treatment.

- Children in 800 families per year (total 2400 families for the 3 years of the program) receive nutritional therapy for rickets.

- At least 50% of households are aware of how to prevent the rickets disease and at least two benefits of iodized salt for school children.

- Coverage of households using iodized salt increased from 21% to 50% in the project area for school Children.

PROJECT AREA

Cox's Bazar Sadar, Maheshkhali and Chakaria Upazillas of Cox's Bazar District.

PROJECT TENURE

3 years: 2008-2010.

DONOR

UNICEF

6. Baseline Survey

6.1 Brief

OBJECTIVES

- To establish a benchmark in the three project upazilas in identifying and describing the present status of knowledge and attitude about Rickets and related practices, and also of use of iodized salt.

METHODOLOGY AND SAMPLING DESIGN

Independent samples were drawn from the three upazilas so that the estimates are reliable 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. In addition several FGDs were conducted with the mothers of children less than 5 years of age. Relevant documents received from SARPV and other sources were also reviewed. Both the survey and the FGDs were done among the households from the lower economic segment of the population. SARPV provided technical assistance as per the need and approved the plans and data collection instruments.

Total 480 households were interviewed under the survey taking 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. In addition 6 FGDs were conducted with mothers eligible for interview, with 2 FGDs per upazila. In each FGD there were 9-14 participants.

DATA COLLECTION INSTRUMENT

A simple questionnaire developed jointly by SARPV and PCSL was used for conducting the interviews with the mothers. 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.

MANAGEMENT AND IMPLEMENTATION TENURE

The study has been designed and implemented by PCSL using the services of a research consultant and one data analyst who shouldered almost all responsibilities. However, the field data were collected by the SARPV field workers who were trained by the consultant at site. SARPV provided all logistic support to the consultants.

DONOR

UNICEF

6.2 Findings

MONTHLY HOUSEHOLD INCOME

All the survey households had at least one child aged 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. The average monthly income of the households in three upazilas was Tk. 3,628/- with Tk. 3,486/- being the lowest in Maheshkhali upazila and Tk.3,760/- the highest in Cox's Bazar sadar upazila.

PROFILE OF THE HEADS OF HOUSEHOLDS

The heads of the sample households had an average age of 34.4 years. Only 2% of the households were headed by women. 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 Sadar (56%) and fisherman in Maheshkhali upazila (15%).

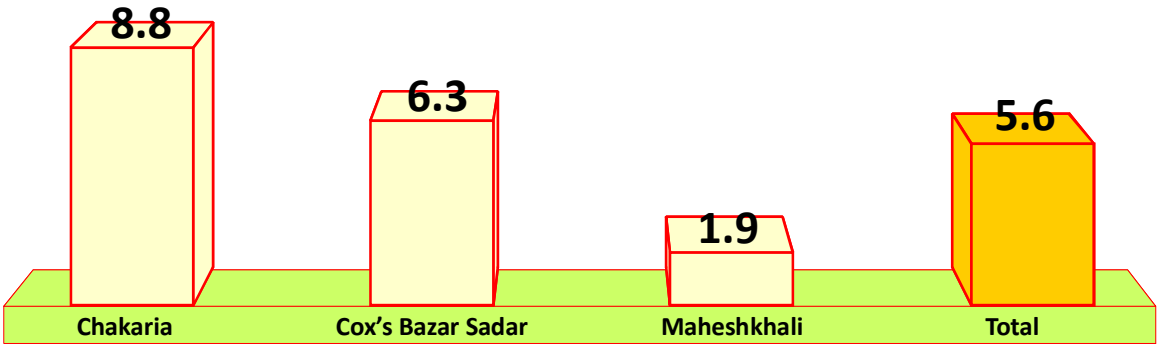
HEALTH PROBLEMS FACED BY THE CHILDREN

Major diseases/health problems children usually suffer from are cold, cough, breathing problem and pneumonia. Other diseases/health problems mentioned frequently are fever, diarrhoea, vomiting and skin disease. The sick children are treated both in the govt. hospitals and by private doctors (both qualified and unqualified). The choice is mixed and depends on the availability of govt. facility nearby. It was gathered that the poor households tend to choose the govt. hospital, as the treatment is expensive at private facility including the doctor's fees.

AWARENESS ON 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. As Rickets-aware mothers were very small in the sample (only 27), further details on them are not discussed here. 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. In the 6 FGDs conducted, none was aware of 'Rickets' as a disease except one participant from Chakaria. None of the participants also knew about any organization working for the disabled except SARPV Bangladesh.

Fig 1: Ever heard about Rickets as a disease



6. Baseline Survey

SYMPTOMS OF RICKETS OBSERVED IN YOUNG CHILDREN

For each of the children aged from 6 months to 5 years in the survey households, the field investigators collected/recorded seven bodily symptoms and conditions in relation to height and weight, wrist joint, ribs and legs and feeling pain while walking. According to SARPV, a child showing at least three of the seven bodily symptoms could be primarily diagnosed as a suspected 'Rickets' patient and he/she should receive immediate attention/treatment. It has been found that overall 7.4% (51 in number) of children showed at least 3 bodily symptoms to suspect that they are Rickets-affected. Such proportion is the highest in Maheshkhali (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'.

Fig 2: Symptoms of Rickets Observed in Young Children

Symptoms	Chakaria	Cox's Bazar	Mohesh khali	Total
1. The height & weight 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
N = Total Children	223	226	240	689
Showed at least 1 symptom	36.3	13.3	25.8	25.1
Showed at least 2 symptoms	14.3	9.3	13.8	12.5
Showed at least 3 symptoms	5.4	7.5	9.2	7.4
Avg. Age of child (years)	2.89	2.93	2.92	2.92
Avg. child per HH	1.5	1.4	1.4	1.4

6.3 FGD Findings

After the symptoms of rickets had been discussed, participants were asked whether the children of their communities showed such symptoms, many of them replied in positive. Higher mention came from two FGDs at Chakaria and one each from Cox's Bazar and Maheshkhali.

HOUSEHOLD PREVALENCE OF RICKETS OR RICKETS-LIKE SYMPTOMS

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 the household prevalence of the primary Rickets symptoms.

DISABILITY PREVALENCE

Presence of disabled member was reported by 5.95% or 29 sample households. Most of them (19) were in Chakaria and mostly physically disabled. Out of 6 FGDs, a few participants informed that physically disabled persons existed in their community.

USE OF IODIZED SALT

Majority (60%) of the respondent households in all 3 upazilas used unpacked salt. In Chakaria this majority of respondents was the highest (75%). The salt in packets used by the 40% of the respondents was tested, and 37.7% was found to be iodized. Except a few participants in Rakhain Para of Cox's Bazar Sadar and Maheshkhali, most of the FGD participants told that they used unpacked salt.

FOOD HABIT

About 50% of the mothers told that they give vegetables five days a week or more to their children. Vegetables are claimed to be eaten more days in Cox's Bazar and Maheshkhali than Chakaria. More than 90% of the children below 5 years of age are reportedly given selected vegetables (Dherosh, Lal Shak and Kochu Shak) and small fish.

USE OF SAFE DRINKING WATER

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

USE OF LATRINE AND SANITATION

Majority (72%) of the households used apparently hygienic pucca sanitary latrines or the ones made with Ring slabs. Such latrines are used more in Cox's Bazar. However, FGDs revealed that the large majority of these latrines are unhygienic as the feces are left open to go to the streams or low lying areas.

6.4 Discussion on Findings

Community Awareness on Rickets and Prevalence Symptoms: It is established from the survey and the FGDs that even simple awareness on 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. However, the survey findings based on investigation of the existence of Rickets or Rickets-like symptoms in children aged between 6 months and 5 years show that household prevalence of at least 3 out of 5 such symptoms is 10.2%. It is also found that there is no significant difference in the socio-economic profile of the households in relation to the prevalence of symptoms of Rickets.

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 unpacked 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

Despite the fact that 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 condition of already nutrition-deficient children is likely to aggravate if the children are attacked with diarrhoea and other water borne and easy to contaminate diseases.

6.5 Conclusion and Recommendations

CONCLUSION

Based on the findings and discussion above, we can conclude that there is risk of 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 systems to the matter. The fact that the risk of Rickets is seen to vary by region within the project area and also among the households with varying food practices, suggests that there is huge felt need to work on the issue. There is also the need and the scope of working together with other programs under health and nutrition sector to reduce the risk of Rickets in the project area, which could also be expanded nationwide.

RECOMMENDATIONS

- Rickets awareness program should be integrated with nutrition promotion program for better comprehension and understanding of the people, at least in the high Rickets prevalent areas.
- Health workers of NNP and other programs who are from the locality and working on nutrition and mothers of the children with rickets, could be trained on identifying rickets in children.
- Lack of sanitation aggravates the already deficient nutritional status of the poor and specially the young children. To this end, the sanitation and hygiene promotion campaign should be strengthened.
- In order to ensure higher availability of food in the poor households, the project could take up income supplementation program along with the Rickets/nutrition promotion campaign.
- The primary school teachers, rural medical practitioners and the religious leaders should be trained on Rickets for wider dissemination of the information on Rickets to the common people.
- Although mothers should be the main target for the Rickets awareness program, the information should also be provided to the male members or household heads as they are the ones who usually buy/collectfood items for the family.
- Mixing lime (chun) with rice during/after cooking as calcium supplementation to the Rickets suspected families was a new information though, as its use yielded a positive result after testing and monitoring, its usage has to be widely promoted. Use of 'Pisha til ' (ground sesame seeds) seems much easier to put into use. This is also subject to test due to relatively less or lack of availability of the product (til) in all the houses.
- The suspected Rickets cases should be medically examined to establish/reinforce the degree of reliability of the symptom based identification. SARPV could take up this initiative.

7. Project Activities

Group Formation

Groups were formed of members of ricketic and non-ricketic children's families in the project area. The purpose of group formation was to disseminate information on prevention of rickets through nutrition, benefit of iodizes salt, sanitation and cleanliness leading to overall livelihood.

Outcome: Families of rickets-affected children are using lime (chun) in rice. Families of both ricketic and non-ricketic children gave more emphasis on their living condition and food habit.

Training Program

Training was provided to School Teachers and Health Worker to build and raise awareness among the community people and other stakeholders on rickets and the possibility to prevent it through improved nutrition only by Ca supplementation, and on the benefits of using iodized salt. Participants of the training sessions included Teachers of Government and Non-Government institutions, Family Planning and Health Workers, Health Assistants, Nutrition Workers of NNP.

Outcome: Participants were able to identify the early signs of rickets and aware of prevention of rickets through nutritional supplementation.

Meeting with Stakeholders

Meetings with different stakeholders such as UP members, journalists, doctors, imams, teachers, students, village leaders were organized to build awareness on prevention of rickets and on how to identify the early signs of rickets.

Outcome: Participants of the meeting were more aware of prevention of rickets and the benefits of using iodized salt.

Video Show at Schools and in the Villages

SARPV Bangladesh organized Video Shows at different schools and villages for mass awareness in the project area.

Outcome: Through the video show community people were able to identify the early signs of rickets and understand how it could be prevented. Also, the message got spread through word of mouth.

Meeting with Health Department

Meetings were organized to share information with the staff-members of family planning department and the members of doctors' community on the prevention of rickets through nutrition and use of iodized salt. Meetings were organized at Upazila level as well. Health workers from Family planning department were sent to Chakaria site of SARPV,

Outcome: Health workers from Family planning department were able to identify early signs of rickets, and had information on how to prevent rickets.

Sharing Meetings at District Level

Meetings were organized at district level to share information with different govt. and non-govt. officials on the prevention of rickets through nutrition and on the use of iodized salt. Deputy Commissioner of the district, Upazila Nirbahi Officer, Civil Surgeon, District Information Officer, Social Welfare Officer, District Primary Education Officer and Upazila Health and Primary Officer took part in the meetings at different points in time.

Outcome: Good rapport was established with officials of different GOs and NGOs.

Seminars and Workshops

Seminars and Workshops were also organized to share information district level officers and civil society representatives on rickets and benefits of iodized salt.

Outcome: The participants of the seminars and workshops were aware of the ricketic situation and were responsive to work for the cause.

7. Project Activities

School Visit

Both government and non-government educational institutes in the project area were visited by the project staff to locate ricketic children and provide information on rickets and benefit of iodized salt

Outcome: Ricketic children were identified. School students became aware of rickets and use of iodized salt.

Stage Drama

SARPV staged live drama in the project area by the field workers to create awareness and to provide information to the grassroots people on rickets and benefit of iodized salt.

Outcome: Grassroots people became aware of rickets and benefit of iodized salt.

Meet the Press

Meetings were organized for journalists to create mass awareness on the issue through media. Project aims and targets were also shared with them in the meetings.

Outcome: Journalists became aware of the threat of rickets and showed interest to make news/coverage on the issue.

Project Activities at a Glance (Jan 2008 - Sep 2010)

SL No	Activities	2008	2009	2010 (Jan - Sep)	Total
1	Patients identified	886	855	692	2433
2	Group Meetings held at patient's house	328	328	241	897
3	Video Show (School)	24	24	24	72
4	Patients identified	24	24	24	72
5	Meeting with different stakeholders	4	4	3	11
6	Meeting with Health department	4	4	3	11
7	Teachers Training on Rickets and benefits of Iodized salt	3	3	6	12
8	Health workers training on Rickets and benefits of Iodized salt	3	3	6	12
9	Sharing Meeting at District level (GO/NGO)	4	4	3	11
10	Workshop on Rickets and benefits of Iodized salt	2	2	0	4
11	Meet the Press	6	6	3	15
12	Visits to Households for identifying Rickets patients	6374	3153	3191	12718
13	Groups Formed	82	59	7	148
14	Live Drama staged	3	3	3	9
15	District level Seminar	0	1	0	1

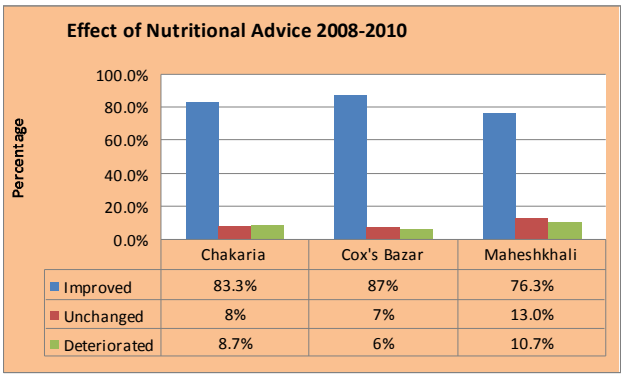
8. Project Findings

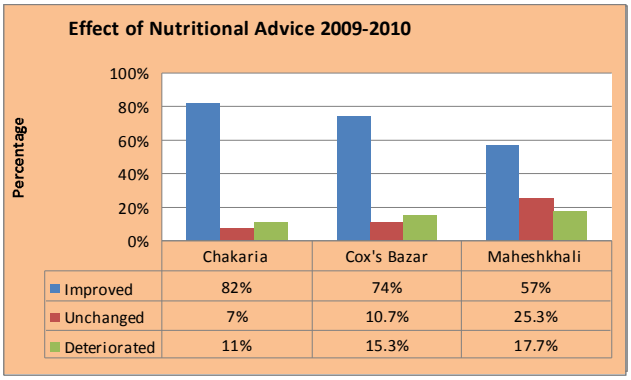
8.1 Rickets patients identified

Upazila	1st year (2008)			2nd Year(2009)			3rd Year (2010)			Total
	Boy	Girl	Total	Boy	Girl	Total	Boy	Girl	Total	
Cox's Bazar	178	122	**300**	164	117	**281**	129	97	**226**	**807**
Chakaria	178	108	**286**	167	107	**274**	145	99	**244**	**804**
Maheshkhali	176	124	**300**	173	127	**300**	146	76	**222**	**822**
Grand total	532	354	**886**	504	351	**855**	420	272	**692**	**2433**

The number of ricketic patients identified has a reducing trend over the project period all over the 3 upazilas under project area. It signifies also the reducing trend in the prevalence of rickets in the children of those areas.

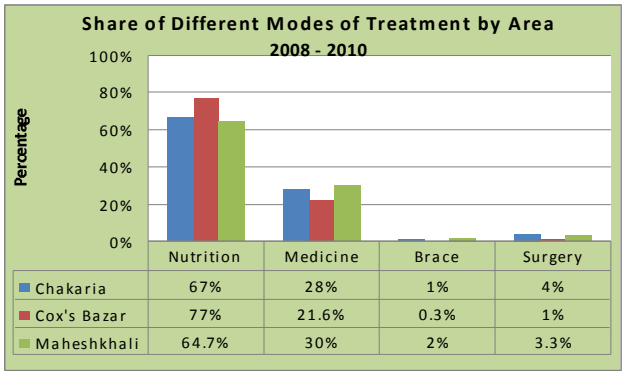
8.2 Effect of Nutritional Advice

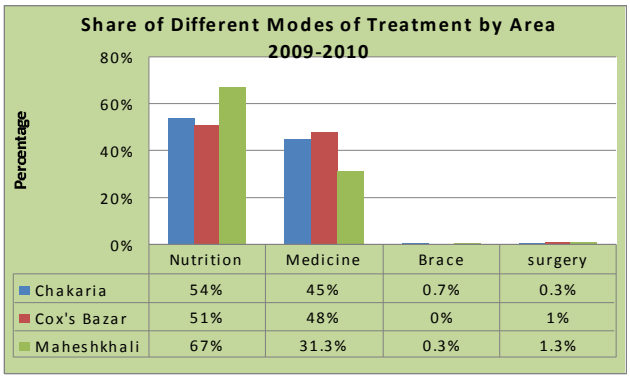




After getting 3 years of service, a good number of children had improvement. Out of total 886 ricketic children identified in 2008 from 3 upzilas, 82.3% (729) were improved. In Chakaria 83.3% (239), in Cox's Bazar 87% (261) and in Maheskhali 76.3% (229) ricketic children had improved.

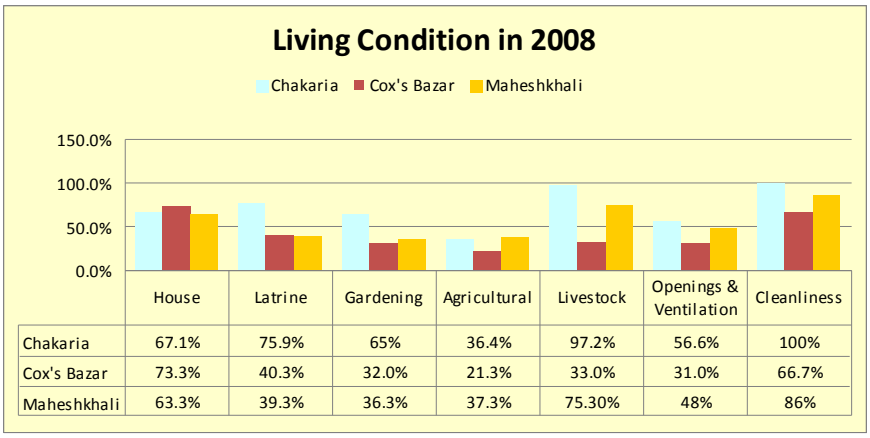
8.3 Share of Modes of Treatment vis-à-vis Area



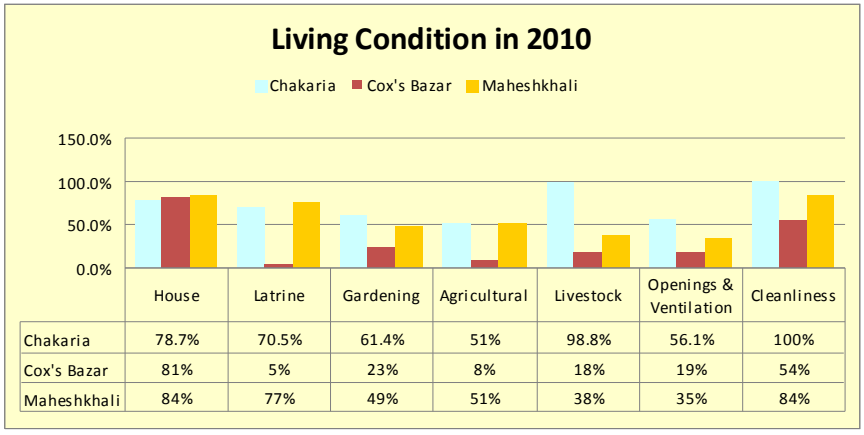


Nutritional advice, medicine (calcium tablet), brace and surgery are different modes of treatment for rickets-affected children. If identified at an early stage, it can be prevented by nutritional advice with calcium tablets alone. It appears that the number of cases handled with nutrition and medication at an early stage is inversely proportional to the number of cases to be handled with brace or surgery.

8.4 Living Condition of the Families of the Ricketic Children



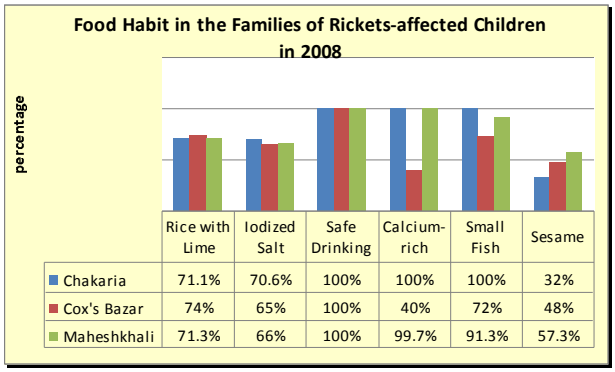
	House	Latrine	Gardening	Agricultural	Livestock	Openings & Ventilation	Cleanliness
Chakaria	67.1%	75.9%	65%	36.4%	97.2%	56.6%	100%
Cox's Bazar	73.3%	40.3%	32.0%	21.3%	33.0%	31.0%	66.7%
Maheshkhali	63.3%	39.3%	36.3%	37.3%	75.30%	48%	86%



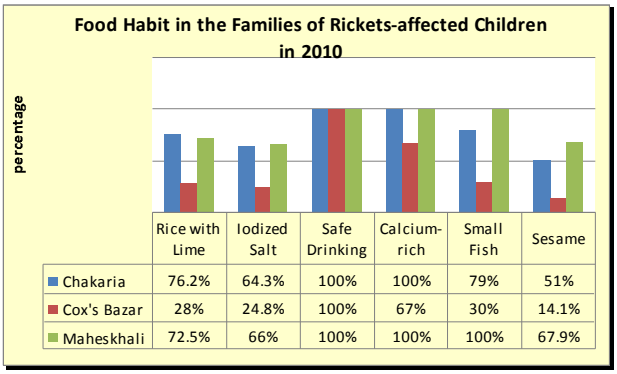
	House	Latrine	Gardening	Agricultural	Livestock	Openings & Ventilation	Cleanliness
Chakaria	78.7%	70.5%	61.4%	51%	98.8%	56.1%	100%
Cox's Bazar	81%	5%	23%	8%	18%	19%	54%
Maheshkhali	84%	77%	49%	51%	38%	35%	84%

As Rickets is likely to have environmental implications, SARPV Bangladesh also gave importance to the living condition of the families of the Ricketic children.

8.5 Food Habit in the Families of Rickets-affected Children



	Rice with Lime	Iodized Salt	Safe Drinking	Calcium-rich	Small Fish	Sesame
Chakaria	71.1%	70.6%	100%	100%	100%	32%
Cox's Bazar	74%	65%	100%	40%	72%	48%
Maheshkhali	71.3%	66%	100%	99.7%	91.3%	57.3%



	Rice with Lime	Iodized Salt	Safe Drinking	Calcium-rich	Small Fish	Sesame
Chakaria	76.2%	64.3%	100%	100%	79%	51%
Cox's Bazar	28%	24.8%	100%	67%	30%	14.1%
Maheskhali	72.5%	66%	100%	100%	100%	67.9%

Rickets is a bone-related disease and one of the greatest health problems in Cox's Bazar. SARPV puts emphasis on the food habit of the families of the Rickets-affected children. After the projet intervention by SARPV, major changes were found in the food habit of those families.

8. Project Findings

8.6 A Questionnaire Survey in relation to Baseline

Question	Chakaria (13)	Maheshkhali (10)	Cox's Bazar (10
Have you ever heard about a disease named 'Rickets'	All (13) said Yes	Out of 10 , 8 said Yes, 2 said No	All (10) said Yes
Do you think 'Rickets' patient can be cured through treatment	All (13) said Yes	Out of 10 , 8 said Yes, 2 said No	All (10) said Yes
Where a 'Rickets' victim child could be treated	All (13) mentioned SARPV-Bangladesh	8 mentioned SARPV- Bangladesh	All (10) mentioned SARPV Bangladesh
Do you know the reasons for which a child may have 'Rickets'	11 said lack of calcium-rich food, 1 said lack of nutritious food and rest 1 said Don't Know	8 mentioned lack of calcium	All mentioned lack of Calc
Do you know how a Rickets affected child can be cured	8 said through calcium-rich food, 4 said by treatment, 1 said through nutritious food	8 said through calcium rich food	All respondents say yes
Where have you learnt about treatment and prevention of Rickets	8 said through poster and leaflet, 4 said by neighbors and 1 answered from friends	8 said from neighbor	All said through poster and
Do you know the name of disease(s) caused due to iodine deficiency	9 said goiter, 2 said rickets and rest 2 said Don't Know	All (10) said goiter	9 said goiter and 1 mention rickets
. Do you mix/ eat lime (*chun*) or crushed tilseed (*Pisha til*) with rice	Total 13 said Yes	8 said Yes	All said Yes

9. Challenges faced

- Inadequate number of field staff. Six staff-members have been working in this project in 3 implementing areas. So it is not easy for the staff to regularly supervise ricketic children along with carrying out other awareness raising activities under the project.

- Chakaria, Maheshkhali and Cox's Bazar are the disaster-prone areas of Bangladesh. It is difficult for the people of these areas to make up their losses due to disasters and maintain a sustainable livelihood.

- Although Rickets is apparently a problem related to environment and food habit, due to lack of education and awareness people did not put emphasis on their food habit and living condition to address the issue of Rickets.

- Lack of transportation remains as another majorchallenge to overcome. Houses of a good number of patients are located in very remote areas. As a result it is difficult not only for the field staff to communicate with the patients but also for the patients to access the services from the project outlets.

- Poor families are not interested to use iodized salt as it is costly. One of the findings points out that the families whose monthly income is within 1,000 taka, they are not able to use iodized salt.

- People are more aware of Rickets now but they ask for food support along with medicine because of their inability to pay for the same.

10. Conclusion

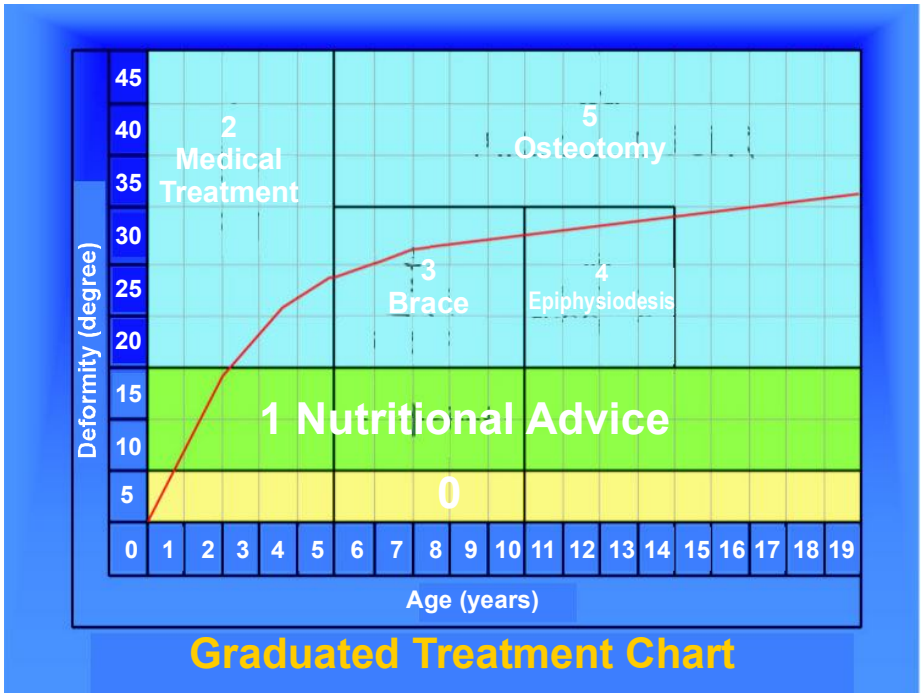
Rickets is one of the major causes to make the children disabled which is curable and preventable. SARPV Bangladesh has been working to prevent the disorder using nutritional therapy with the support of UNICEF. But the children who have clinical rickets received higher level of treatment like brace and surgery at the SARPV rickets and disability centre at Chakaria.

The awareness program has been going on with different groups of stakeholders at different levels including local level communities and GO-NGOs officials and health department personnel etc.

Due to resource limitations the project is being implemented in only 3 Upazilas of Cox's Bazar district Other parts of Cox's Bazar are yet to be reached where people are still in the dark in relation to knowledge about rickets and how to prevent it.

Tool for Treatment Decision

THE GRADUATED TREATMENT



Using the chart, developed in 2005 by a group of international experts along with Dr. Thierry and his team from France, the course of action regarding treatment is determined considering the age and the degree of deformity of the patient. Modes of treatment include Nutritional advice, Medical Treatment, Long leg brace, Osteotomy (cutting bones) and Surgical Epiphysiodesis (leg lengthening or shortening)

Accounts Statement

SARPV- BANGLADESH
PROJECT NAME- PREVENTION OF RICKETS THROUGH NUTRITION
FUNDED BY - UNICEF BANGLADESH
RECEIPT & PAYMENT
FOR THE PERIOD OF DECEMBER 2007 TO SEPTEMBER 2010

#A		Receipt	Amount (Tk)
1		**Opening Balance**	
		Cash In Hand	-
		Cash at Bank	-
		Fund A/C	5,586,370
		Receible From - UNICEF	614,427
		Sub Total	**6,200,797**
#B		**Payment**	**Amount**
2		**Personnel :**	
	i)	10% of Chief Executive Salary(40000/10=TK.4000)	148,360
	ii)	100% of Coordinator-1	580,537
	iii)	100% of Field Monitor-6 (To supervise the house holds)	1,186,197
	iv)	100% of Finance Assistant-1	199,560
	v)	100% of Office Assistant-1	145,104
3		**Awareness,Coordination,Collabraton with other GO/NGO**	
	i)	Quarterly 1 meeting with health department -3 Upazilla	43,886
	ii)	Dialouge meeting with the different stakeholders of the Community	48,145
	iii)	Sharing meeting at district level with the diffient officials and NGOs on this issue Quarterly-1	66,002
4		**Traning of organizational Health Workers (20/Year/Up)**	-
	i)	Training to the health worker CWN how to identify Ca and I deficiency	412,222
	ii)	Selected School Centred program and community program	147,309
		Training to the Teacher how to identify Ca and iodine deficiency	445,175
	iii)	Video show in 24 selected villages in each year on Rickets	178,239
5		**Advocacy & Lobbing with Local Govt.**	-
	i)	Local Workshop in each year one on Rickets and another one is on IDD at Upazillz Level	214,019
	ii)	Local Seminer at district Level	72,810
	iii)	Documentation Expenses (on Rickets and IDD reporting etc)	256,300
6		**Communication meaterials Development**	
	i)	Technical partners Meeting once in a year for Review	178,842
	ii)	Life Drama	150,049
	ii)	Poster On Rickets and IDD-1	325,850
	iv)	Print Media Campaign	81,322
7		**Monitoring & Evalution of the project**	-
	i)	External Evalution By the AMD and from the UNICEF	199,961
	ii)	Monitoring by head office of SARPV	247,395
	iii)	Documentation Published by the expart	99,300
8		**Capital Expenditure**	
	i)	Laptop	110,000
	ii)	Portable Generator	49,000
9		**Project Support Cost**	-
	i)	Communication (mobile, Telephone, e-mail)	58,651
	ii)	Computer Printing Expenses (Stationary & Computer Acessories)	122,125
	iii)	Local Travelling cost for the awarness program& video show	58,753
	iv)	Office Rent 30% of 16,000 taka	125,760
10		Unspant Fund Refund	249,924
		Sub Total	**6,200,797**
11		**Closing Balance**	
		Cash In hand	
		Cash at Bank	
		Sub Total	**-**
		Grant Total	**6,200,797**

Activities Album

Follow-up of ricketic patients

Visit by UNICEF team

Visit to ricketic patient's house

Sharing Meeting with Govt and Non Govt officials

Training session with health department

Training Session

Activities Album

Secy of Ministry of Health Sheikh Altaf Ali, DG of Health Services Dr. Prof. Shah Monir Hossain and Civil Surgeon Dr. Kajol Kanti visit Ramu in Feb 2010

Technical meeting at BRAC INN, Dhaka-2010

Live Drama being staged

Technical meeting at BRAC INN, Dhaka-2010

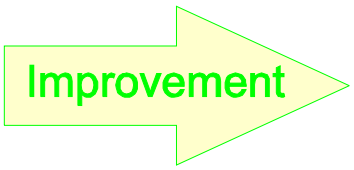
Press Conference

Seminar at district level

Sadia saved from rickets

Sadia Akhter is the youngest child of Abdul Maleq. Maleq is a day laborer and the only earning member of the family. His monthly income is 4,000 taka. Sadia's mother Sajeda Begum is a housewife. Sadia has three sisters and one brother. Now Sadia Akhter is 9 years old. 3 years back, she was identified by the field workers of SARPV as a ricketic child. As she was identified in the early stage she was given nutritional advice. Ever since, she has been taking calcium-rich vegetable, small fish, and also mixing lime while cooking rice. Now Sadia is cured and thus has been saved from the curse of disability.

Before Nutritional Advice

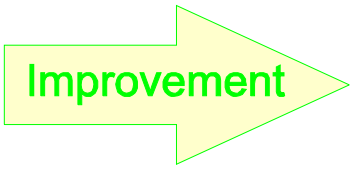


After Nutritional Advice

Babul enjoys a rickets-free childhood

Before intervention by SARPV Bangladesh Babul's family thought that their son was affected by "Kulbiyar" (local name of rickets) and he will never be cured. Babul's father Nurul Alam is a day labourer and is the only earning member of the family while his mother Ayesha Khatun is a housewife. He is the youngest of two brothers and one sister.

Before Nutritional Advice



After Nutritional Advice

Now 6 years old, Babul was identified as a rickets patient in 2008 by a field monitor of SARPV Bangladesh working under the 'Prevention of Rickets through Nutrition Project' supported by UNICEF. Considering his age and deformities of leg he was advised to take nutritious food. Accordingly his family made changes in his food habit. They put lime in rice while cooking and also took calcium-rich vegetable, small fish, sesame seed. Due to their financial inability he could not have milk, egg or meat on regular basis. But his family was trying their best to give Babul such kind of food at times. After receiving the service for three years, now Babul is cured and he enjoys a rickets-free childhood.

Some of the IEC Materials Produced

Booklet in Bangla

Poster in Bangla

Poster in Bangla