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COMPARATIVE COMMUNITY STUDY ON THE SAFETY AND
ACCEPTANCE OF RICE-BASED AND GUR-BASED ORS

Interim Report on the
Implementation of Teaching Programme

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CHAPTER I: Introduction

The Bangladesh Rural Advancement Committee (BRAC) is a multi-sectoral rural development organisation dedicated to the socio-economic upliftment of the rural poor of Bangladesh. Founded and managed entirely by the Bangladeshis, BRAC has been working on different development programmes with innovative approaches. As a core part of BRAC, the Research and Evaluation Division (RED) has been providing appropriate baseline information and analysis of the multi-dimensional projects since 1975. The Division prepares project assessments, undertakes baseline surveys and conducts research on social and economic problems faced by the people of rural Bangladesh (BRAC, 1987a). The Division has recently undertaken a research on the acceptability and safety of rice-based oral rehydration salt (ORS) for diarrhoea from January 1987. The field of the research is divided into three parts, viz., (1) Baseline Survey, (2) Implementation of a programme of teaching the mothers on the preparation and use of rice-based and gur-based ORS, and (3) Follow-up surveys. The research is being done in three Unions of Jaipurhat district (formerly Bogra district). This is an interim report on the programme implementation part of the field research.

CHAPTER II: Diarrhoea, ORT and Rice-based ORS

The Problem of Diarrhoea and the Oral Rehydration Therapy (ORT)

Diarrhoea is a major cause of mortality, morbidity and malnutrition in developing countries particularly in children. Between 5-10 million people are estimated to die from diarrhoeal

* This interim report has been jointly prepared by Dr. A.M.R. Chowdhury and Mr. F. Karim. Others who are directly involved with this study are Mr. J. Ahmed and Mr. S. R. Chowdhury.

diseases every year (Walsh and Warren, 1979) and it is greatest in children under 2 years of age (Snyder and Merson, 1982). In Bangladesh alone, more than 250,000 die from it every year most of whom are children under 5 years of age (Guerrant and Cash, 1973). Between 3-5 billion diarrhoea infections are estimated to occur in developing countries every year (Walsh and Warren, 1979). Diarrhoea is the most common illness in rural Bangladesh after respiratory tract illnesses (Black, Brown, et al., 1982) and the morbidity rates are highest in young children with 39 percent of all diarrhoea being experienced by children under 5 years of age (Chen, 1978). The interaction between diarrhoea and malnutrition is well documented in Bangladesh and elsewhere. Diarrhoea is the most common illness of nutritional importance (Ronde, 1978).

The best therapy for almost all types of diarrhoea is to replace what is lost in the stool (Chowdhury, 1986). It is likely that from time immemorial people have been practicing oral fluid therapy 'at least in order to quench thirst' (Pinberg, 1980). The first use of oral fluid as a treatment method of diarrhoeas was first reported as early as 1832 (Lancet, 1832). Since then fluid therapy has been used sporadically until the discovery of its scientific basis in recent times .

Based on research findings, the World Health Organisation (WHO) suggested a formula for ORS which, according to Hirschhorn, was 'suitable for most cases of diarrhoea regardless of etiology or age of the patient' (Hirschhorn, 1982). The WHO has recently modified this formula and the following one is now suggested (Anonymous, 1984).

* For a discussion on the history of fluid therapy, see (Chowdhury, 1986).

Table 1: Formula of ORS suggested by World Health Organisation.

Composition	mmol/L	Ingredients	Weight (grams)
Sodium Chloride	90	Sodium Chloride	3.5
Potassium Bicarbonate	80	Trisodium citrates	2.9
Glucose	20	Potassium chloride	1.5
Water	30	Glucose	20.0
	111		
	1 litre	Water	1 litre

Packets of ORS containing these ingredients (called 'the complete formula') have been promoted in many diarrhoea control programmes. Because of limitations with these packets, such as logistics and cost, several programmes have used an 'incomplete formula' meaning that the ORS contains only the essential ingredients such as sodium chloride, glucose (or sucrose) and water. The programme run by the Bangladesh Rural Advancement Committee (BRAC) belongs to the later category.

The Rice Based ORS

Research on ORS, however, has not stopped. Scientists have been looking for a still better ORS (Mahalanabis et al., 1975). Recent discoveries have found that the use of rice powder in place of glucose is as effective as a glucose-based ORS and, at the same, has the following additional advantages (Molla, et al., 1985; Patra et al., 1982).

- a) decreases stool output
- b) decreases the duration of diarrhoea
- c) reduces the volume of vomitus; and
- d) provides extra calorie.

The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) has been using this new ORS in its treatment

facilities for the last few years with good results. This has also been tried in a small community trial in Chandpur, Bangladesh, with promising results (Rahman, et al., 1985).

Earlier research done by BRAC found that a reason for the infrequent use of lobon-gur ORS was that people considered it to be ineffective as it "did not stop diarrhoea" (Chowdhury, 1986). With the above extra qualities of this new innovation, particularly that it reduces the stool volume and duration of diarrhoea, BRAC saw a great potential in its use by the people. However, most trials with this ORS was clinic-based and little was known about its acceptability by mothers as well as their ability of making this ORS. Before embarking on with a larger programme, BRAC wanted to do a pilot research to find out answers to certain specific questions related to its feasibility.

Pre-Research at Laxmipur

In order to find out a methodology of teaching the preparation and use of rice-based ORS to mothers, a pre-research was carried out in two villages of Laxmipur district. This study was done by a team of 7 staff - 5 female and 2 male - all of whom were trained at ICDDR,B on rice-based ORS. The following questions were addressed through this pre-research:

1. What should be the formula for rice-ORS (R-ORS)?
How much of salt, rice and water?
2. What is the method of preparation? How long the mixture to be boiled?
3. How the mothers will be taught ?
Individually or in group?

If in group, should everyone in the group be asked to prepare the R-ORS or only one from the group prepares and others observe how it is done?

4. Who supplies the ingredients-mothers or BRAC workers?

5. What type of rice to be used in teaching: rice-powder, parboiled rice or unboiled rice?

On the basis of this pre-study which was done on 995 households and included teaching by different methods and formulae, and monitoring of the outcome, the following formula was arrived at.

Lobon (common table salt)	- 1 pinch
Rice	- 1 fistful
Water	- 10 chhatak (approx. 583cc)

The following steps are necessary to make and use the R-ORS:

Step 1: Measure one fistful of rice (any variety)

2: Soak it in water for sometime (approximately 5 minutes)

3: Smash and paste this soaked rice in a pre-cleaned "pata" (grinding bed made of stone)

4: Mix this paste with 10 chhatak (approximately 583 cc) of drinking water and stir

5: Boil it until the first bubble

6: Cool it down and add one 3-finger pinch of lobon (common table salt) and stir well

7: Give it to the patient.

Teaching of the Method

As per the latest BRAC policy^{*}, it was decided to do the teaching of R-ORS to mothers only in groups. However, considering the time taken, it was decided to ask only one mother to prepare it in front of all other participants.

Supply of Ingredients

Surveys on the availability of ingredients in different parts of

* As practiced in its nation-wide ORT (lobon-gur) teaching programme.

Bangladesh have revealed that more than 80% of households have any variety of rice. So, it was decided not to supply the rice or other ingredients for making the R-ORS during teaching.

Type of Rice

Although it takes longer time to paste, parboiled rice was preferred by BRAC workers in showing the preparation methods to mothers in view of its popular use and availability in most part of Bangladesh. However, it was decided to promote any type of rice as well as pre-grounded rice (rice powder) for making R-ORS at home.

CHAPTER III: The Joypurhat Community Trial: A Comparison of Rice-based and Gur-based ORS

INTRODUCTION

The Bangladesh Rural Advancement Committee (BRAC) has been conducting a programme of teaching a seven-point message on ORT to mothers in rural Bangladesh since 1980. The message includes a method of making an oral rehydration salt (ORS) solution with home ingredients. This solution is made by adding a pinch of lobon (common table salt) and a fistful of gur (unrefined brown sugar) to a half seer (467 cc) of drinking water followed by stirring. Female field workers visit each household in the village and teach the seven-point message to mothers. More than three quarters of the rural households of Bangladesh have already been visited and taught the message (BRAC, 1987). Monitoring and evaluation results speak of encouraging results, particularly with respect to the retention of knowledge. Although the usage of the method in case of severe watery diarrhoea was encouraging, it was not the same for mild to moderate watery and dysenteric diarrhoea. A good number of evaluations have been done on

this programme and a list is included in the reference at the back of this report.

As mentioned in the earlier chapter, the potentials of the newly discovered rice-based ORS was recognised by BRAC and it decided to carry out a pilot research on the feasibility of teaching this method to the community in a way similar to lobon-gur ORS teaching and compare the outcome with that of lobon-gur ORS. In this chapter, we will particularly deal with the progress made so far in carrying out this research as well as present the methodology and some initial results.

OBJECTIVES

The following are the objectives of this research.

1. To compare the composition of the rice-based and gur-based ORS prepared by mothers at home.
2. To compare the usage of the rice-based and gur-based ORS in different types of diarrhoea.
3. To compare the attitude of mothers towards rice-based and gur-based ORS.
4. To compare the programmatic aspects (such as amount of time taken to teach a mother, problems in teaching, availability of ingredients and instruments, etc.) related to teaching of rice-based and gur-based ORS.
5. To compare the costs of teaching rice-based and gur-based ORS.

Clearly, our endeavour is not to compare the relative effectiveness of these two types of ORS in reducing stool volume or the duration of diarrhoea.

METHODOLOGY

Study Design

A three-cell study was designed. Each cell consisted of an union and different treatments (education) were given in each as follows:

- Union 1 : Mothers were taught the seven points diarrhoea message, promoting the use of lobon-gur ORS (henceforth called G-ORS union)
- Union 2 : Mothers were taught the seven points diarrhoea message, promoting the use of rice-based ORS (henceforth called R-ORS Union)
- Union 3 : Mothers were taught the seven points diarrhoea message, promoting the use of both lobon-gur ORS and rice-based ORS (henceforth called 'combined' union).

A baseline survey, teaching of the ORS (the "seven points") and follow-up surveys including indepth village case studies are the field activities for this research. We will deal particularly with the teaching programme in this report.

Selection of Unions

There were a number of criteria for selecting the unions which were:

1. The unions will be situated within a district, preferably within or adjoining upazilas (for comparability)
2. The unions have not been covered by the BRAC lobon-gur ORS teaching programme
3. 'Sheel-pata' (indigeneous grinding stone and roller made of stone) is popularly used for grinding spices*.

Considering these criteria, the following unions were selected:

* It is essential to have it (not necessarily in every household) in order to ground and paste the rice. Some areas, such as Mithapukur in Rangpur district, were found where clay-made 'sheel pata' are used. It is, however, not possible to ground and paste the rice in a clay-made 'sheel pata'.

Fig. - 1.

Comparative Community Study on the Safety and Acceptance of Rice-based and Gur-based ORS

MAJOR ACTIVITIES AND TIME SCHEDULE

ACTIVITY	M O N T H S																	
	J/87	F/87	M/87	A/87	M/87	J/87	J/87	A/87	S/87	O/87	N/87	D/87	J/88	F/88	M/88	A/88	M/88	J/88
PREPARATION	XX																	
BASELINE SURVEY	X	XXXX																
ORT TEACHING			XXXX	XXXX														
FOLLOW-UP - 1					XXXX	XXXX	XXXX											
FOLLOW-UP - 2								XXXX	XXXX	XXXX								
FOLLOW-UP - 3											XXXX	XXXX	XXXX					
FOLLOW-UP - 4														XXXX	XXXX	XXXX		
DATA PROCESSING				XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
ANALYSIS AND REPORT PREPARATION																	XXXX	XXXX

1. Preparation:

- Area Selection
- Administrative Contact at different levels
- Staffing and training

3. ORT Teaching:

- Seven-points message (including ORT) Teaching
- Monitoring
- ORT sample collection
- Chemical analyses

5. Data Processing:

- Editing, Coding
- Computer entry

2. Baseline Survey:

- Households Listing and Sketching
- Socio-Demographic and Diarrhoea related data collection

4. Follow-up:

- Data collection on Diarrhoeal episodes and treatment
- ORT sample collection from the users.

6. Analysis and Reporting:

- Tabulation
- Interpretation

Table 2: Selected unions for G-ORS and R-ORS study

	<u>District</u>	<u>Upazila</u>	<u>Union</u>	<u>Treatment</u>
1.	Joypurhat	Joypurhat	Dhalahar	G-ORS
2.	"	"	Bhadsha	Combined
3.	"	Khetlal	Baratara	R-ORS

The first treatment, viz., the teaching of lobon-gur ORS, was randomly allocated to Dhalahar union. As Bhadsha was geographically in between Baratara and Dhalahar unions, this was selected for both lobon-gur ORS and rice-based ORS teaching. Consequently, Baratara was given rice-based ORS.

Baseline Survey

A baseline survey was carried out in each household of all the selected unions. As some unions had more than 2,500 households, the baseline survey was carried out in about 2,500 households in each union making a total of 7,500 households in three unions. In this survey, information on a number of items were collected such as: demographic and socio-economic background of the population; diarrhoea incidence (by the four folk types^{**}) last two weeks and treatment used and; availability of ingredients for G-ORS and R-ORS (such as gur, sugar, rice, rice-powder, "sheel-pata" etc.).

The actual survey was conducted on 7,543 households in 60 villages of the three unions. A pre-tested questionnaire was used. Before the baseline survey, the households (7,543) were listed and village sketch-maps were prepared. There were three teams of female

* This was taken to be a minimum size to find reliable information on usage of ORS (Chowdhury, 1986).

** As found by (Chowdhury, 1986).

interviewers, one each for an union, and each supervised by a male supervisor. The whole baseline survey took approximately one month to complete.

THE TEACHING OF ORT

As soon as the baseline survey was completed, the teaching of the seven points message was started in the three unions. Separate messages were used for G-ORS, R-ORS and 'combined' unions, particularly the preparation of the ORS. The seven point messages have been given in Appendix 1, 2 and 3.

Similar to the baseline survey, three teams of Health Workers (HWs) were used for teaching, one in each union. Depending on the time needed to teach a particular method, the composition of the teams varied. Five HWs for G-ORS union, 6 in R-ORS and 7 for 'Combined' union were hired for the purpose of teaching. Each team also had two male Programme Organisers (POs) and a cook. The senior PO was in charge of the team. The HWs and POs were trained for five days by the senior staff of BRAC on the seven point message. Each team also included HWs who were trained for the pre-study at Laxmipur (see earlier chapter) by ICDDR,B. It took about two months to complete the teaching.

Although the baseline survey was conducted only on 7,543 households, the teaching programme, however, included all households of the unions. The core of the teaching programme was a simple, concise but comprehensive message called the Seven Points to Remember, as mentioned earlier, which is considered to be sufficient to treat most types of diarrhoea at home. This message has been adapted from a

similar message developed by BRAC for its ORT programme and are given in Appendix 1, 2 and 3.

The HWs visited a village and organised group teaching of the seven points. In a small partnership of two HWs, one organised a maximum of 5 mothers in one place while the other imparted the teaching using teaching aids such as flip charts. A similar methodology was used in each union, for comparability. After the teaching was completed, the HWs asked one mother from amongst the group to prepare the ORS (G-ORS or R-ORS or both depending on the union). The HWs also helped the mother, if she was not sure what to do. In actual situation, all the other mothers also participated in helping their compatriot prepare it in front of the HW. All mothers, however, brought their own water pots to be shown the measurement of water. Once the demonstration of preparation was completed, the HWs asked each mother and children around to taste the ORS. The HW then repeated the whole teaching again, this time by asking questions, to make sure that every mother understood it correctly. After the completion of a session with a group of mothers, the HW wrote down the names and addresses of all mothers who were taught, and then left the place for another session with another group of mothers.

The POs had other work. Before the visit to a village by HWs, the POs visited that village to meet village elites and other people in order to create a congenial environment. During the teaching also, one PO remained in the village to give the HWs any support. The POs also visited local educational institutions such as primary and secondary schools to teach the students and inform the teachers about the programme. They also contacted other male members of the community through meetings and seminars at mosques, bazars and with

village doctors. Apart from the above, the HWs and POs also looked for diarrhoea patients during their visit to the villages and treated them with ORS. Meetings of villagers were organised in the presence of treated patients. This was done to have a demonstration effect. Also, diarrhoea patients were treated at the residential place/camp of the HWs.

Monitoring of the Teaching

The quality of teaching was monitored after a month of teaching. Most of the monitoring procedures followed by BRAC for its ORT programme was adopted for this research.

A monitors' team was formed the members of which were all female except the supervisor who was a male. Five percent mothers who were taught the seven points message were selected at random and the monitors visited them at their home addresses to check the retention of knowledge about the seven points as well as their ability of preparing an ORS (G-ORS or R-ORS or both depending on the union). The mothers were asked questions related to the seven points and graded according to their answers on a scale of 0 to 10 as follows:

- A: Scored 10 points and could prepare the ORS correctly
- B: Scored 7 to 9.5 and could prepare the ORS correctly
- C: Scored less than 7 points and could prepare the ORS correctly
- D: Could not prepare the ORS correctly.

The structured form used to interview the mothers and grade them is given in Appendix 4. At the end of the interview the monitors asked the mother to prepare an ORS for her (monitor). A sample of this prepared ORS was taken in a screw-cap vial and was later

analysed for chloride at the ICDDR,B, Dhaka. Ten percent of the samples were also analysed for sodium, potassium and glucose. We will present results from this monitoring in the following section.

RESULTS

Baseline Survey

A total of 7,543 households were selected for the baseline survey out of which 7,179 were successfully interviewed. The data are being processed now and results from it will be included in a later report.

Teaching of ORT

Coverage of Households: As mentioned earlier, the teaching of ORT was conducted in all 111 villages of the selected unions. A total of 12,402 households were taught the seven point message which was nearly 97 percent of the households in the unions. Coverage of households per day by an HW varied according to the type of ORS taught. On average, an HW taught 24.8 households in G-ORS union, 14.3 in R-ORS union and 12.4 in 'combined' (G-ORS + R-ORS) union. Details of these results are given in Appendix 5.

School and Mosque Program: The PJs visited 46 primary and secondary schools and taught the message to 3,173 participants. The PJs also addressed the Friday congregations in 22 mosques and conducted 3 seminars with village doctors. A total of 459 diarrhoea patients were treated and followed up.

Also, 1,500 printed scripts on the seven points were distributed to the literates in the villages. There were separate scripts for each union differentiated by colour of the paper used.

Time Spent in Teaching: Average time taken to teach a group of

mothers on different ORS methods was calculated. As shown below, the maximum time taken was as expected, in the union where teaching of both the methods was done.

Table 3: Time taken to teach a group of mothers by different types of ORS

Types of ORS	Amount of time taken (in minutes)
G-ORS	49
R-ORS	60
Combined	90

Knowledge About 7 Points: As mentioned in a previous section, mothers receiving OMT teaching from HMs were interviewed a month later to know their knowledge about the messages and on the basis of their responses each mother was graded. Efforts were made to select the mothers who themselves prepared the solution during teaching separately from those who did not prepare themselves but observed the preparation. A total of 604 mothers were visited. Of them, 355 belonged to the first category (viz., they themselves prepared ORS during teaching demonstration) and the remaining 249 belonged to the latter category (who only observed the preparation). Amongst the first category mothers, proportion scoring either 'A' or 'B' were 97.4, 93.7 and 99.3 for G-ORS, R-ORS and 'Combined' unions respectively. There were none in 'D' grade. For the second category, the proportions were not much different. Details of these results are given in appendix 6.

Actual marks (out of 10) scored by mothers have also been analysed. Average marks scored by mothers was more than 9. See Appendix 7 for more details.

Estimated Sodium Concentrations: The safety indicator for an ORS

solution is the amount of sodium in the solution. Estimation of sodium from ORS directly is costly and some studies, (Ali, et al., 1984) suggested the use of chloride as a proxy indicator for sodium, particularly for home solutions in Bangladesh. Accordingly, the solutions prepared by mothers during monitoring were analysed for chloride at ICDDR,B, Dhaka. Based on results from a random subsample of it (10%) in which the sample solutions were also analysed for sodium, the correlation coefficient (r), multiple correlation coefficient (R^2) and regression coefficient (a and b) were calculated. A correlation of $r = 0.92$ (see Figure 2) and a R^2 of 0.86 were found. Using the regression coefficients (a = 9.60 and b = 0.66), estimated sodium concentrations were found from the corresponding chloride concentrations by using the equation: $\text{Na}^+ = 0.44 + 0.66 \text{ Cl}^-$

During monitoring, mothers prepared sample solutions of G-ORS or R-ORS depending on the method which was taught to them and both in the 'combined' union. The following table shows the estimated sodium concentrations in those solutions.

Table 4: Estimated sodium concentrations in different unions (type of ORS)

Na ⁺ (in mmol/L)		Unions			
		G-ORS	R-ORS	Combined	
				G-ORS	R-ORS
< 30	No.	2	2	7	18
	%	0.8	1.2	3.3	8.2
30 - 99	No.	123	153	157	132
	%	98.4	95.7	87.4	88.1
100 - 119	No.	1	1	11	5
	%	3.4	1.9	5.1	2.5
120 +	No.	1	1	6	5
	%	0.6	1.2	4.2	1.6
n		227	160	214	213
Mean/ (mmol/L)		61.8	49.5	70.4	78.6
S.D.		18.2	21.6	16.7	14.8

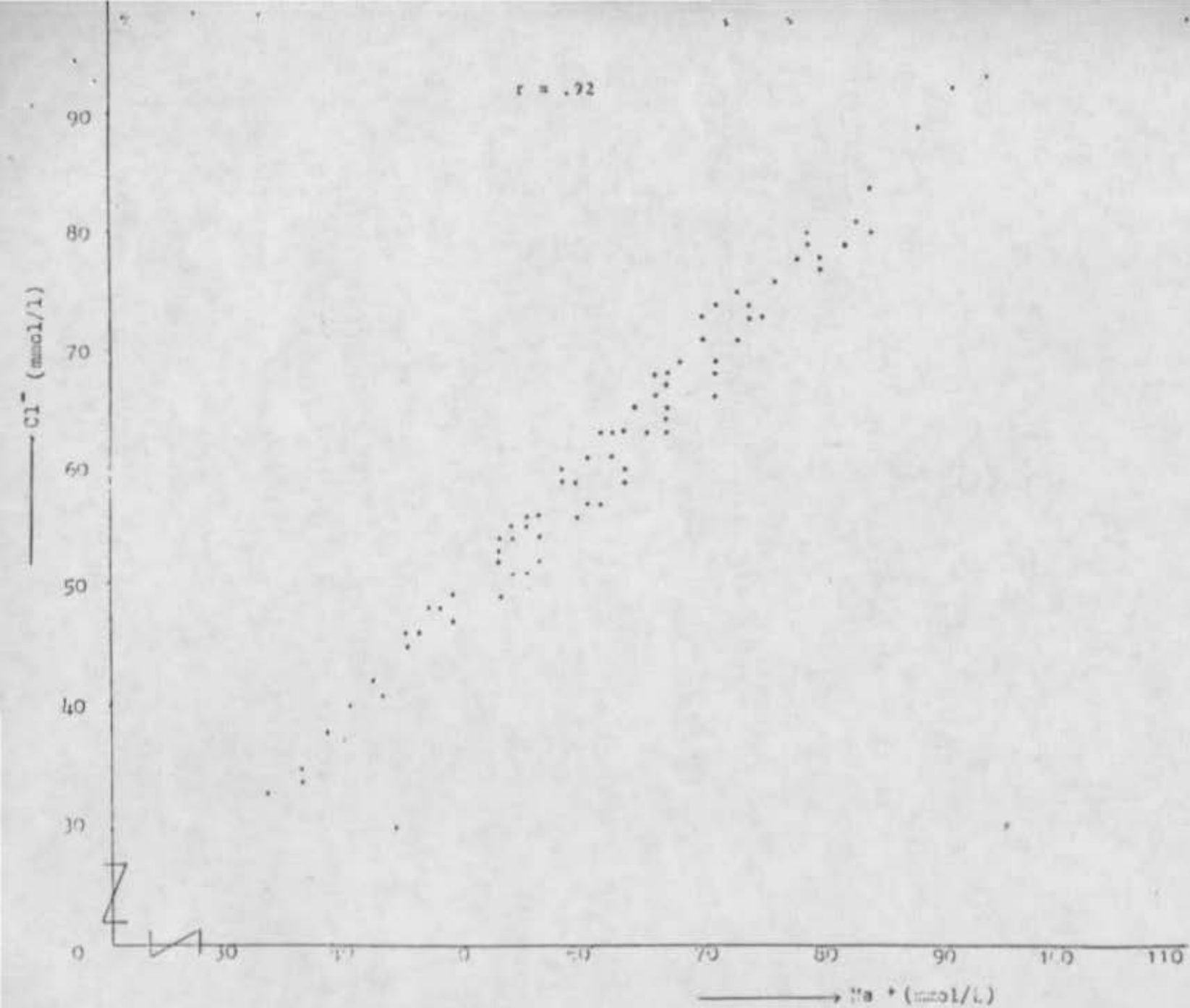
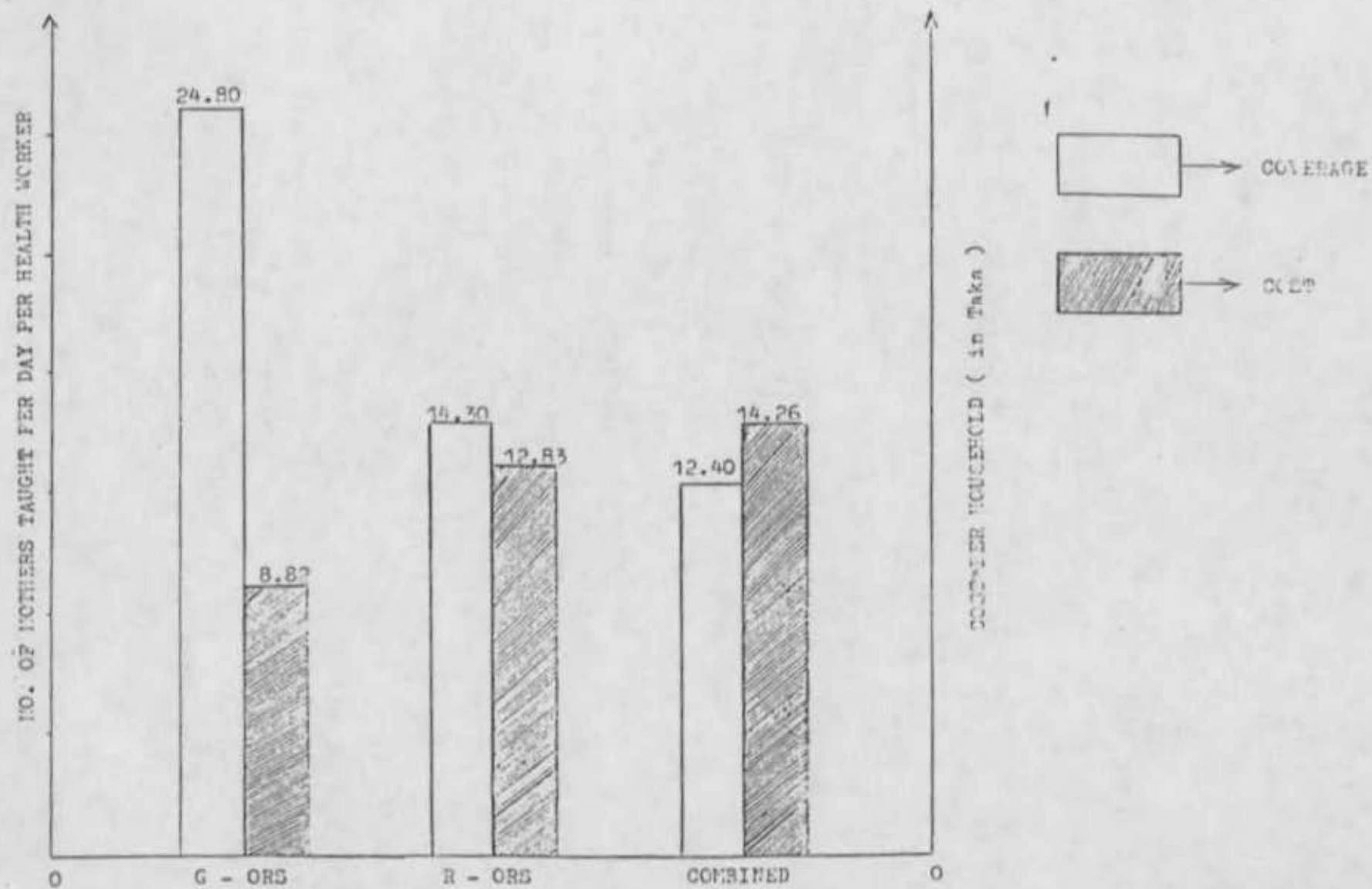


Fig. 2. Scatter diagram showing the association between chloride estimated by chloro-counter and sodium estimated by flame photometer from ORS solutions prepared by rural mothers with home ingredients (salt - sugar or salt - rice).

Fig. - 3.

BAR DIAGRAM SHOWING NO. OF MOTHERS TAUGHT PER DAY PER HEALTH WORKER WOMEN (coverage) AND COST PER HOUSEHOLD IN EACH STUDY UNION (in Taka)



The concentrations are encouraging for all groups of mothers. Proportions in 'safe and effective' (sodium concentration of 30-99 mmol/L) range are between 87.4 to 98.4 percents. However, mothers who were taught both G-ORS and R-ORS in the 'combined' union tended to do worse than those who were taught a single method.

These results have also been analysed separately for mothers who themselves prepared the ORS during teaching demonstration and those who only observed the preparation. These are given in Appendix 8, which shows a significant difference ($p < .05$) in sodium concentration (for both G-ORS and R-ORS) between the two categories in 'Combined' union. However, there was no such difference in the unions where a single method was taught.

Potassium Concentrations: Eighty five sample solutions (44 G-ORS and 41 R-ORS) were analysed for potassium. As shown below, the amount of potassium available in R-ORS was negligible compared to G-ORS.

Table 5: Potassium concentrations in G-ORS and R-ORS

K + (mmol/L)	Types of ORS			
	G-ORS		R-ORS	
	No.	%	No.	%
< 5	-	-	41	100.0
5 - 9	-	-	-	-
10 - 19	22	50.0	-	-
20 - 29	18	40.9	-	-
30 +	4	9.1	-	-
n	44		41	
Mean/mmol/L	19.9		1.3	
S.d.	5.4		0.5	

Glucose Concentrations: Eighty four sample solutions (43 G-ORS, 41 R-ORS) were analysed for glucose concentrations. The mean

concentrations (109 for G-ORS and 98 for R-ORS) appear to be acceptable but the variance is quite high as shown in the following table.

Table 6: Glucose concentrations in G-ORS and R-ORS

Glucose (mmol/L)	Types of ORS			
	G-ORS		R-ORS	
	No.	%	No.	%
< 60	7	16.3	6	14.6
60 - 89	10	23.2	11	26.9
90 - 119	5	11.5	9	22.0
120 - 149	12	28.0	13	31.7
150 +	9	22.0	2	4.8
n	43	100.0	41	100.0
Mean/mmol/L	109.1		98.4	
S.d.	45.1		36.9	

Costs: Costs incurred only in respect of the programme of teaching ORS have been considered in this section. Costs incurred with respect to other research activities such as baseline survey and follow-up surveys have not been considered.

The costs for programme implementation thus include costs for teaching the seven points, monitoring and analyses of sample ORS solutions. A total amount of Taka 146,444 was spent in implementing the programme in the three unions. Costs for G-ORS, R-ORS and 'Combined' unions have been Taka 41,746, Taka 41,482 and Taka 63,216 respectively. This means that, on average, an amount of Taka 8.82, Taka 12.83 and Taka 14.26 were spent in teaching G-ORS, R-ORS and (G-ORS + R-ORS) respectively to a household. Details of the costs are given in Appendix 9. Although the gur was supplied by BRAC* during teaching demonstration, the cost per household covered was less in G-ORS union than in R-ORS union.

* Gur was purchased from local markets for the purpose.

CHAPTER IV: DISCUSSION

BRAC has undertaken a research to study the feasibility of rice-based ORS (R-ORS) teaching in the community as well as to compare the acceptability and safety of this with the BRAC method of gur-based ORS (G-ORS). The study is being conducted in three unions of Joypurhat district. Three treatments, viz., teaching mothers on G-ORS, R-ORS and both ('combined'), have been given, one in each union. This report documented the teaching programme as well as provided some results from programme monitoring which was done one month after teaching. The research includes other activities such as a baseline and four follow-up surveys. The next report will deal extensively with results from these surveys. In the following we will discuss the preliminary results that are available mainly from the programme (of teaching) implementation part of the study.

Three teams of health workers (HWs) were used, one for each union and it took nearly 2 months to complete the teaching in each union.

Because of group approach in teaching (a group consisting of a maximum of 5 mothers), the number of mothers (or households, as one mother was taught from each household) taught per day by an HW was more than what was found with individual teaching (Chowdhury, 1986). More mothers, however, were taught by an HW per day in G-ORS union than in R-ORS union, mainly because the demonstration of rice-based ORS preparation took more time. It took 60 minutes to teach rice-based ORS to a group of mothers compared to 49 minutes taken in teaching gur-based ORS.

There were, however, little difference between the G-ORS and R-ORS with respect to monitoring results. Proportions in A, B, C or D

were almost identical. Average scores on the recollection of the seven points were also similar. The sodium values, too, were similar and so were the glucose values. However, the G-ORS appeared to have an added advantage as gur contained a good amount of potassium.

With respect to cost, the programme of teaching G-ORS was cheaper, mainly because it took less time to teach compared to R-ORS.

There were several other problems with respect to the acceptability of both G-ORS and R-ORS. The actual acceptance, people's attitude towards and the problems in acceptability are being investigated now through quarterly surveys and indepth village case studies. Future reports will deal particularly with these issues.

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Appendix 1

The Seven Points to Remember (for 'Lobon-gur ORS' Union)

1. What is Dudhaga (infantile diarrhoeal, Ajirno (indigestion), Diarrhoea or Cholera and their bad effects?

Dudhaga, Ajirno, Dysentery, Diarrhoea or Cholera etc. are all characterised by loose motion. With each loose motion salt and water contents drain out from the body. If this draining out of salt and water continues for sometimes, the body becomes dehydrated. Severe dehydrations mostly leads to death. So, necessary steps should be taken in time in case of Dudhaga, Ajirno, Dysentery, Diarrhoea or Cholera.

2. Symptoms of Dehydration

In dehydration, patient develops certain signs i.e., sunken eye, dry tongue, thirst, sunken fontanelle (in case of a child), severe weakness, reduced urine, with cold extremities.

3. Simple Management of Loose Motions

The simple management of dehydration is the replacement of salt and water lost from the body. Remember, patient dies of dehydration (loss of salt and water). So, whenever a patient gets Dudhaga, Ajirno, Dysentery, Diarrhoea or Cholera, give oral saline from the very onset of the disease or immediately after the first loose stool.

4. Preparation of Oral Saline

Lobon-Gur Saline (LGS) is prepared with a three finger pinch (upto the first crease) of lobon and one fistful of gur in half seer of drinking water, well stirred. Care should be taken to mix lobon, water and gur in right proportion. A fistful of (refined) sugar can be used if gur is not available.

5. Administration of Oral Saline

Adult patients should take half a seer of oral saline at a time after each loose motion. Children should be given only as much as they want, but at frequent intervals. Once saline is prepared, it may be kept 4-6 hours only.

Contd.....P/ 2

Appendix 2

The Seven Points to Remember (for 'Rice-ORS' Union)

1. What is Dudhaga (infantile diarrhoeal), Ajirno (indigestion), Diarrhoea or Cholera and their bad effects?

Dudhaga, Ajirno, Dysentery, Diarrhoea or Cholera etc. are all characterised by loose motion. With each loose motion salt and water contents drain out from the body. If this draining out of salt and water continues for sometimes, the body becomes dehydrated. Severe dehydrations mostly leads to death. So, necessary steps should be taken in time in case of Dudhaga, Ajirno, Dysentery, Diarrhoea or Cholera.

2. Symptoms of Dehydration

In Dehydration, patient develops certain signs i.e., sunken eyes, dry tongue, thirst, sunken fontanelle (in case of a child), severe weakness, reduced urine, with cold extremities.

3. Simple Management of Loose Motions

The simple management of dehydration is the replacement of salt and water lost from the body. Remember, patient dies of dehydration (loss of salt and water). So, whenever a patient gets Dudhaga, Ajirno, Dysentery, Diarrhoea or Cholera, give oral saline from the very onset of the disease or immediately after the first loose stool.

4. Preparation of Oral Saline

One fistful of any dried rice to be soaked in water for a period of 5-10 minutes. Squash with molar on grinding plate until it becomes pulp. Mix the pulp in 10 chhatak of drinking water. Boil it until first bubbling comes out. Stir with a clean stick/spoon so that no sediment can create. Take off from the oven, cool and mix one three-finger pinch (upto the first crease) of salt, well stirred. One fistful of rice powder can be used also.

5. Administration of Oral Saline

Adult patients should take half a seer of oral saline at a time after each loose motion. Children should be given only as much as they want, but at frequent intervals. Once saline is prepared, it may be kept 4-6 hours only.

6. Advice on Nutrition

During Dudhaga, Ajirno, Dysentery or Diarrhoea, the patient should be given plenty of water and food-stuffs like rice, curry along with oral saline. In case of children, breast milk/normal diet should be continued. Increased amount of food should be given at least for 7 days after recovery. This will prevent malnutrition and weakness of the patient.

7. Prevention

To save ourselves from this disease, we should drink tubewell water. In case tubewell is not available, water from other sources should be boiled and then cooled before use. Rotten food should never be eaten. All food-stuffs should be covered well so that flies cannot sit on them. Hands and mouth should be washed by soap or safe water before eating. Hands should be washed by soap or ash after return from latrine and even after cleaning the babies after defecation. Remember that breast-milk is harmless. Children put to breast immediately after birth and breast-fed rarely have diarrhoea.

6. Advice on Nutrition

During Dudhaga, Ajirno, Dysentery or Diarrhoea, the patient should be given plenty of water and food-stuffs like rice, curries along with oral saline. In case of children, breast milk/normal diet should be continued. Increased amount of food should be given at least for 7 days after recovery. This will prevent malnutrition and weakness of the patient.

7. Prevention

To save ourselves from this disease, we should drink tubewell water. In case tubewell is not available, water from other sources should be boiled and then cooled before use. Rotten food should never be eaten. All food-stuffs should be covered well that flies cannot sit on them. Hands and mouth should be washed by soap or safe water before eating. Hands should be washed by soap or ash after return from latrine and even after cleaning babies after defecation. Remember that breast-milk is harmless. Children put to breast immediately after birth and breast-fed rarely have diarrhoea.

Appendix 3

The Seven Points to Remember (for 'Comoined' Union)

1. What is Dudhaga (infantile diarrhoea), Ajirno (indigestion), Diarrhoea or Cholera and their bad effects?

Dudhaga, Ajirno, Dysentery, Diarrhoea or Cholera etc. are all characterised by loose motion. With each loose motion salt and water contents drain out from the body. If this draining out of salt and water continues for sometimes, the body becomes dehydrated. Severe dehydrations mostly leads to death. So, necessary steps should be taken in time in case of Dudhaga, Ajirno, Dysentery, Diarrhoea or Cholera.

2. Symptoms of Dehydration

In dehydration, patient develops certain signs i.e., sunken eye, dry tongue, thirst, sunken fontanelle (in case of a child), severe weakness, reduced urine, with cold extremities.

3. Simple Management of Loose Motions

The simple management of dehydration is the replacement of salt and water lost from the body. Remember, patient dies of dehydration (loss of salt and water). So, whenever a patient gets Dudhaga, Ajirno, Dysentery, Diarrhoea or Cholera, give oral saline from the very onset of the disease or immediately after the first loose stool.

4. Preparation of Oral Saline

It can be prepared in two ways:-

- a. Lobon-Gur Saline (LGS)

To be prepared with a three finger pinch (upto the first crease of lobon and one fistful of gur in half a seer of drinking water well stirred. Care should be taken to mix lobon, water and gur in right proportion. A fistful of (refined) sugar can be used if gur is not available.

- b. Rice-based ORS (R-ORS)

One fistful of any dried rice to be soaked in water for a period of 5-10 minutes. Squash with molar on grinding plate until it becomes pulp. Mix the pulp in 10 chnatak of drinking water. Boil it until first bubbling comes out. Stir with a clean stick/spoon so that no sediment can create. Take off from the oven, cool and mix one three-finger pinch (upto the first crease of salt, well stirred. One fistful of rice powder can be used also.

Contd.....P/2

5. Administration of Oral Saline

Adult-patients should take half a seer of oral saline at a time after each loose motion. Children should be given only as much as they want, but at frequent intervals. Once saline is prepared, it may be kept 4-6 hours only.

6. Advice on Nutrition

During Dudhaga, Ajirno, Dysentery or Diarrhoea, the patient should be given plenty of water and food-stuffs like rice, curry along with oral saline. In case of children, breast milk/normal diet should be continued. Increased amount of food should be given at least for 7 days after recovery. This will prevent malnutrition and weakness of the patient.

7. Prevention

To save ourselves from this disease, we should drink tubewell water. In case tubewell is not available, water from other sources should be boiled and then cooled before use. Rotten food should never be eaten. All food-stuffs should be covered well so that flies cannot sit on them. Hands and mouth should be washed by soap or safe water before eating. Hands should be washed by soap or ash after return from latrine and even after cleaning the babies after defecation. Remember that breast-milk is harmless. Children put to breast immediately after birth and breast-fed rarely have diarrhoea.

Appendix-4
Monitoring Form

HW's Code No.

Team No.:

Operational Period:

Observe () of the following: No

Union:

Sl. No.	Learner's Name	Name of Head of Household (HHH)	Relationship with HHH	Para	Village	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
						What types of diseases cause dehydration and why? (1+1)	What are the symptoms of dehydration? (1)	What are the signs for rehydration (1)	When to begin and why? (1+1)	How much? (1 + 1)	When to refer to a doctor? (1)	Prevention (1)	Nutritional advice (1 + 1)	Total marks secured	Preparation of ORS/ORS	Grading	Sample Vial No.	Volume of water (liters)		
01																				
02																				
03																				
04																				

Note:

Column 1 - 3: Figures within parenthesis indicate the marks for correct answers.

Column 10 : For correct preparation of ORS put C while for incorrect preparation put D and in case of no knowledge put 0.

Grading : A = 10 marks and ORS correct,
B = 7-9.5 marks and ORS correct,
C = < 7 marks and ORS correct,
D = ORS incorrect

Prevention:

- Colostrum and breast-feeding
- drinking safe water
- not to eat contaminated food
- to keep covered food covered
- washing hands before eating
- washing hands after coming from latrine and even after cleaning babies after defecation.
- keep the diarrhoeal stool inside the titch and covered.

Abstract

A	B	C	D

Appendix 5

Number of households taught and the average coverage per HW.

Union	Nature of ORT	Total village	Total HHS as per '81	Total HHS taught	No. of HWS days	Coverage per day per HW	% of total HHS taught
Dhalaher	G-ORS	42	4,924	4,735	191	24.8	96.1
Baratara	R-ORS	31	3,315	3,233	226	14.3	97.5
Bhadsha	G-ORS+ R-ORS	38	4,587	4,434	358	12.4	96.6
All	-	111	12,826	12,402	775	16.0	96.7

Appendix 6

Distribution of Learners who prepared ORT and who have not done so during teaching by monitoring grades.

Types of ORT		Learners who prepared ORT during teaching lesson					Learners who did not prepare ORT during teaching				
		Graduation					Graduation				
		A	B	C	D	Total	A	B	C	D	Total
R-ORS	No.	56	24	1	-	81	35	12	2	-	79
	%	69.1	29.6	1.2	-	100.0	44.3	53.2	2.5	-	100.0
G-ORS	No.	58	55	3	-	116	60	50	2	-	112
	%	50.0	47.4	2.6	-	100.0	53.6	44.6	1.8	-	100.0
Combined	No.	93	64	1	-	158	38	19	1	-	58
	%	58.9	40.3	0.6	-	100.0	65.5	32.8	1.7	-	100.0
All	No.	207	143	5	-	355	133	111	5	-	249
	%	58.3	40.3	1.4	-	100.0	53.4	44.6	2.0	-	100.0

Distribution of learners by marks secured during monitoring

Types of Learners	Nature of ORT														
	G-ORS					R-ORS					G-ORS + R-ORS				
	Marks secured out of 10					Marks secured out of 10					Marks secured out of 10				
	10	7-9.5	<7	Total learners	Avg.	10	7-9.5	<7	Total learners	Avg.	10	7-9.5	<7	Total learners	Avg.
Learners who prepared ORT during teaching session	58	55	3	116	9.0	56	24	1	81	9.3	93	64	1	156	9.5
Learners who have not prepared	60	50	2	112	9.1	35	42	2	79	9.0	38	19	1	58	9.6
All	118	105	5	228	9.1	91	66	3	160	9.1	131	83	2	216	9.6

Appendix 8

Estimated Na⁺ Concentration

Na ⁺ (mmol/L)	G-ORS Union		R-ORS Union		Combined Union			
	G-ORS		R-ORS		R-ORS		G-ORS	
	Learners who prepared during teaching	Who have not prepared	Learners who prepared during teaching	Who have not prepared	Learners who prepared during teaching	Who have not prepared	Learners who prepared during teaching	Who have not prepared
<30	1 (0.9%)	1 (0.9%)	1 (1.2%)	1 (1.3%)	11 (6.9%)	7 (11.9%)	5 (3.2%)	2 (2.4%)
30-99	113 (97.4%)	110 (99.1%)	80 (96.4%)	73 (94.8%)	142 (89.3%)	50 (84.8%)	139 (85.7%)	48 (81.4%)
100-119	1 (0.86%)	--	1 (1.2%)	2 (2.6%)	4 (2.5%)	1 (1.7%)	7 (4.5%)	4 (6.8%)
120 +	1 (0.9%)	--	1 (1.2%)	1 (1.3%)	2 (1.3%)	1 (1.7%)	4 (2.5%)	5 (8.5%)
All	116 (100%)	111 (100%)	83 (100%)	77 (100%)	153 (100%)	59 (100%)	135 (100%)	59 (100%)
Mean/mmol/L	61.9	60.24	60.1	58.7	59.1	60.0	60.9	72.3
S.d.	11.2	8.6	11.3	11.9	11.9	15.5	14.55	19.1

The parentheses indicate percentages

Appendix - 9

Expenditure incurred for ORT teaching, Monitoring and
Chemical analysis

Sl. No.	Heads of Expenditure	Type of ORT			Total (Taka)
		G-ORS (Taka)	R-ORS (Taka)	G+R-ORS (Taka)	
1.	Initial supplies	895	382	884	2661
2.	Salaries & Benefits.....	23576	27015	35350	85941
3.	Housing & Transportation.....	1299	1283	3716	6298
4.	Stationeries.....	342	287	305	934
5.	Utilities..... (Lighting, fooding, entertainment)	420	420	420	1260
6.	Operational supplies - Gur....	1199	--	1200	2399
7.	Training expenses.....	460	460	460	1330
8.	Chemical analysis.....	8074*	3654	15400	29128
9.	Publicity.....	273	273	273	319
10.	H.O. expenses (all).....	5208	5208	5208	15624
Total cost		41,746	41,482	63,216	146,444
Total households taught		4,735	3,233	4,434	12,402
Cost for each household (Taka)		8.82	12.83	14.26	11.81

* Number of samples analysed were more in G-ORS union than in R-ORS union.