

NATIONAL WORKSHOP ON ORAL REHYDRATION



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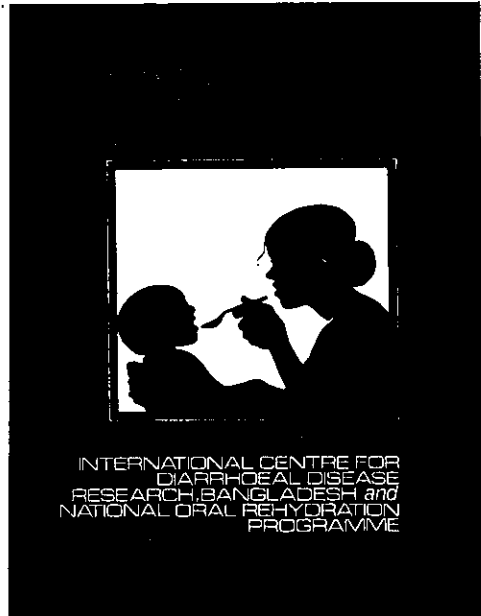
INTERNATIONAL CENTRE FOR
DIARRHOEAL DISEASE
RESEARCH, BANGLADESH *and*
NATIONAL ORAL REHYDRATION
PROGRAMME

26th to 28th september, 1979

PROCEEDINGS
OF THE
NATIONAL
WORKSHOP ON
ORAL REHYDRATION

**INTERNATIONAL CENTRE FOR
DIARRHOEAL DISEASE RESEARCH, BANGLADESH
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PREFACE

This is a summary of the proceedings of the National Workshop on Oral Rehydration held on 26—28 September, 1979 at the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). Copies of the complete papers presented at the Workshop are available from :

Dr. K.M.S. Aziz, Associate Director (Training & Extension), ICDDR,B, G.P.O. Box 128, Dacca-2, Bangladesh.

The sections on Background, Organization, Production, Training and the Role of ICDDR,B were compiled from papers presented by Dr. Mustaqul Huq, Dr. Mahboober Rahman, Dr. W.B. Greenough III, Dr. K.M.S. Aziz, Professor M.A. Matin, Professor A.Q.M. Badruddoza Chowdhury, Mr. M.K. Anwar, and UNICEF's project proposal for the National Oral Rehydration Project. The final section of recommendations came from the summaries of the group discussions which were headed as follows :

Group I — Operational Procedures (Implementation)

Opening Speaker : Dr. Mahboober Rahman
Chairman : Dr. Mustaqul Huq
Rapporteur : Dr. Anthony Measham

Group II — Training Materials

Opening Speaker : Dr. K.M.S. Aziz
Chairman : Dr. Hasan Ali
Rapporteur : Dr. K.M.S. Aziz

Group III — Composition of Solutions

Opening Speaker : Dr. David Sack
Chairman : Dr. M.A. Latif
Rapporteur : Dr. W.B. Greenough III

Group IV — Discussion on (1) Cottage Industry, (2) Home-made Solutions and (3) Quality Control

Opening Speaker : Dr. M. Mujibur Rahaman
Chairman : Dr. J. Galea
Rapporteur : Dr. M. Mujibur Rahaman

Group V — Coordination and Evaluation

Opening Speaker : Dr. Lincoln Chen
Chairman : Dr. Michael Irwin
Rapporteur : Ms. N. Kanawati

BACKGROUND AND OBJECTIVES OF THE NATIONAL ORAL REHYDRATION PROGRAMME

The greatest killers in Bangladesh, especially among children, are diarrhoeal diseases; surveys indicate between 20% and 30% of all deaths are due to diarrhoeal diseases. Eradicating these diseases is a difficult job. Social circumstances, riverine environment, water supply, and the people themselves create difficulties. There are thana health complexes, rural dispensaries, union sub-centres and private and traditional practitioners, but they are not able to manage the large number of dehydration cases which occur following attacks of diarrhoea. Dehydration can be controlled by intravenous fluids, but that is not a widely usable method. Research, both in Matlab and Dacca, has provided the answer in the form of oral rehydration salts which could be dissolved to make solution.

The Government of Bangladesh, in cooperation with UNICEF, ICDDR,B and WHO launched the National Oral Rehydration Programme in March, 1979. The programme objective is to reduce mortality due to acute diarrhoeal diseases. This is expected to be accomplished by an operational objective of supplying ready-made plastic-wrapped packets produced in Bangladesh using locally available salts and sugar. The strategy is to prepare these packets at the thana dispensaries and thana health complexes.

The Oral Rehydration Programme has another goal as well: to supply oral rehydration salts in bulk to hospitals, dispensaries and thana health complexes for use as a replacement for intravenous fluids which are necessary only for severe cases. The thana health complexes would serve as depot holders, and a training place if necessary.

The programme is divided into two parts. Almost 40% will be training, and the other 60% will be directed toward the production and distribution of the oral rehydration salt packets.

With the help of many organizations, the National Oral Rehydration Programme will be extended to cover the whole country to lower mortality from diarrhoeal diseases, especially in rural and remote village areas where there is insufficient medical care.

ORGANIZATION OF THE NATIONAL ORAL REHYDRATION PROGRAMME

The National Oral Rehydration Programme is guided by a National Implementation Committee composed of two members from UNICEF, two members from the Government, one member from ICDDR,B and one member from WHO. It is the job of this committee to advise and coordinate the programme. At the headquarters level there is a Director (Dr. Mustaqul Huq) and an Additional Director (Dr. Mahboober Rahman).

There are a number of supporting officers and staff. In each division, district, sub-division and thana, the respective Deputy Director, Health Services, Civil Surgeon, Deputy Civil Surgeon, and Thana Health Administrator are responsible for the management of the project. In each union, sub-sector and village the Union Medical Assistant/Assistant Health Inspector, Family Welfare Worker and Government Health Assistant are responsible for training and distribution of oral rehydration salts packets. From the union level downwards local bodies, village committees and voluntary village health workers are responsible for packet distribution.

The headquarters team in Dacca are responsible for monitoring project activities, training, packet production, logistic support and evaluation. They keep consolidated records, reports, budgets and accounts of the project, training curricula, training schedules, and evaluation forms are processed by them.

From the outset the Implementation Committee decided that the pilot area would be two thanas in two districts. In this small area the objectives outlined for the project can be implemented. There are demands to expand to other areas but rapid expansion might reduce the project's credibility.

The target of the project is to cover 68,000 villages in the country. There will be a minimum of two Voluntary Health Workers in every village, whose job it will be to distribute oral rehydration salts packets and instruct people how to use them properly. These Village Voluntary Health Workers will be selected based on the following characteristics: (1) aptitude for and willingness to work in the project, (2) residence in the village, and (3) some

education, preference will be given to women and people having some education. Names are suggested by the union council and candidates are interviewed at the ward by the Family Welfare Worker and Government Health Assistant who explain the programme and ask for their help. The volunteers sign a paper indicating their willingness.

The Oral Rehydration Programme is part of an overall Primary Health Care objective. A primary health care project formulation was done last year in six thanas: Muktagacha in Mymensingh; Palashbari in Rangpur; Ghatail in Tangail; Jhikargacha in Jessore; Srinagar in Dacca; and Daudkandi in Comilla. In these six thanas primary health care services will be set up. Every village has 9-11 volunteer members to form a committee; they are not Government officials, they are villagers. The village elders and oral rehydration workers on that committee work side by side to nominate the Village Voluntary Health Workers. A two week training programme includes nutrition, immunization, sanitation and treatment of common ailments. Since diarrhoea is the most prevalent of the common diseases, oral therapy training is included. In the thana of Daudkandi, the workers identified 453 Village Voluntary Health Workers and gave 15 days of primary health care training in addition to the oral therapy training programme. So, there are depot holders who have completed the training in these six thanas. In this connection there are two models which have been tried in the field on the basis of (1) a Primary Health Care Project (2) an oral rehydration project. Funds are limited and primary health care activities will have to be centered in these six thanas. Once the funds are available for the oral rehydration project, these activities will be extended. The oral rehydration project is a starting point for primary health care activities. Village volunteers are identified and trained for one day in oral rehydration therapy which can be expanded to include other programmes such as nutrition, immunization and sanitation.

To evaluate the programme's work, a field evaluation mechanism has been designed. An evaluation design has been prepared by UNICEF, ICDDR,B and NORP. Other agencies have already been requested to fund evaluation activities. The evaluation will occur in sample villages where activities will be monitored to see whether the objectives of the project are being met.

PRODUCTION AND SUPPLY OF ORAL REHYDRATION SALTS

Production objectives for the National Oral Rehydration Programme are to establish production and distribution units in four divisions by June 1981, and to produce 2.5 million packets of ORS annually by June 1982.

Production of oral rehydration salts, following the formula recommended by WHO¹, has been started. In two production centres, Dacca and Comilla, women factory workers manually produce 120,000 packets per month. At the donor's request the manufacturing plants will not expand rapidly as it may jeopardize quality control. About 300,000 packets have been manufactured in these two plants alone, and two new plants opening in Jessore will produce a thousand packets per day.

Quality of the raw materials used in production and the finished packets is being monitored by ICDDR,B. One packet of ORS, taken at random from every lot, is sent to ICDDR,B as a matter of routine. Packets manufactured so far are within acceptable limits set by ICDDR,B.

In the present project design there will be a constant supply of ORS packets at the thana health complexes and at all dispensaries from whose outpatient departments it will be distributed. These supplies will be requisitioned by the Thana Health Administrator or Medical Officer from the production centres. The thana health complexes will also supply ORS packets to the Supervisors of the Voluntary Village Health Workers who will in turn keep these workers supplied.

The Health Inspectors, Sanitary Inspectors and Assistant Health Inspectors will also carry a stock of ORS packets with them when they make their routine visits to the villages.

1 Sodium chloride 3.5 grams, potassium chloride 1.5 grams, sodium bicarbonate 2.5 grams, sugar 40 grams

TRAINING

During the cholera epidemic in Chandpur and other places in Bangladesh in 1977 it became apparent that trained personnel were not available at the thana level. A training course for diarrhoeal disease management and therapy was started in collaboration with the Government of Bangladesh and ICDDR,B. After that the Ministry of Health initiated a National Oral Rehydration Project in cooperation with UNICEF. When the National Oral Rehydration Programme began, it was considered desirable to continue this course until the end of 1979 so that a majority of the Government doctors in the thana health complexes could receive training and subsequently act as resource personnel and trainers for other health workers.

Training objectives for the National Oral Rehydration Programme are to train 40,000 Government workers and 200,000 Village Health Workers by the end of 1980, to train the villagers with the help of trained staff by June 1982, and to produce materials such as posters, pamphlets and flip charts by December 1981.

The first stage of the National Oral Rehydration Programme's multi-tier training approach takes place at the national level where the Civil Surgeon is briefed by NORP Director and Additional Director on the programme and possible problems he is likely to encounter. The second tier occurs at the district level where the Civil Surgeon conducts a one-day workshop to train the Thana Health Administrator, Medical Officer, Deputy Civil Surgeon, Health Inspector and Sanitary Inspectors. These people in turn become trainers in the third tier at the thana level where they lead a one-day seminar for the Family Welfare Workers, Government Health Assistants, the thana council members and thana level Government workers from various departments. Subsequently, the Family Welfare Workers and Government Health Assistants are briefed every month during their routine visit to the thana. The fourth tier of the training programme takes place at the ward level where the Village Voluntary Health Workers (the keystone of the whole programme) are trained for one day by the Family Welfare Workers and the Government Health Assistants.

The training of Village Voluntary Health Workers starts as soon as they are recruited and the training base selected. On the first day

of training the worker is given a package containing ten packets of ORS. Printed materials show him or her how to prepare the solution, how and when it is to be taken, etc. This is one of the main guideline materials for the trainers as well as the trainees. Along with these materials each person is given a small register in which he or she is to keep a record of who has been given packets, why they were given, how many were given, the date and the results (cured, referred to the hospital or death). Information will be taken from this register and put on a reporting form. This reporting form will not give names, but will indicate how many people received the packets, age distribution, total number of packets given, the outcome of the treatment and how many packets the Village Voluntary Health Worker had left at the date of the report.

At present the programme is confined to two districts—Dacca and Comilla—where some of the hypotheses established in the project objectives are being tested. Activity is centered in two thanas where 1,400 Village Voluntary Health Workers have received training. About 3,000 thana level workers have been trained in these two districts, and the training of all 6,000 should be completed by the end of October 1979. The total number of Village Voluntary Health Workers to be trained in these two districts will be around 20,000; their training should be finished by the end of 1979.

THE ROLE OF ICDDR,B

The process of training and extension is complex and involves many groups in order to define effective ways to train individuals in the various methods of oral rehydration. What is the role of a research and training centre such as ICDDR,B in this process?

First and most importantly it will serve as a focus where new ideas and methods for the application of this technology may be discussed and carefully tested in the field to evaluate the relative effectiveness of any variations. One such area may be to establish an economic and easily accessible carrier of sodium and water into the body during diarrhoea. The best known effective agent, glucose,

is available commercially. Certain amino acids are also known to have similar properties. However, since both these elements are present in the human diet, research is warranted to test efficacy, efficiency and effectiveness of different domestic food items in the rural areas to act as a carrier of sodium and water. Such research will help promote home-based practice of early ORS treatment in the rural areas, where prepared products and/or glucose are not readily available.

Logically, next in importance after reasearch, is teaching people to master this new technology and apply it promptly and effectively. The extension system needs to be properly trained in preparing ORS with minimum variation in electrolyte concentrations. Such training, with all the implication of materials design, teaching trainers is a necessary precondition to achieve the objective of reducing mortality due to diarrhoea.

Interest has been formed among divergent groups, and many good ideas will come from this multifarious approach. However, good ideas are not sufficient in themselves. It is essential that they be tested and compared to the standard approach, that of the packaged formula advocated by the World Health Organization and the National Oral Rehydration Programme.

The resources of ICDDR,B will be deployed with the highest priority to assist any groups who wish to test their ideas against the standard practice. ICDDR,B will also test ideas of merit in its clinical research centre and field areas in order to be a catalyst in the rapid spread of effective oral rehydration therapy to all those afflicted with diarrhoea in this country, in the region, and in the world.

The following pages contain abstracts of nine papers which were presented at the National Workshop on Oral Rehydration.

ORAL REPLACEMENT THERAPY IN RURAL BANGLADESH WITH HOME INGREDIENTS

Dr. Ted Ellerbrock, BRAC

The programme took place in 8,359 households in four isolated thanas of Sylhet District where there are no roads. Women were taught to make the *labon-gur* mixture using finger measurement, when to use it, how much to give, when the mixture can be dangerous, when a doctor should be consulted, and what nutritional advice should be given to a person suffering from diarrhoea. The women were trained by Oral Replacement Workers who visited their homes. After a few weeks monitors visited 1,079 randomly selected households to test the retention of the information taught to the women and to test her ability to make the mixture correctly. It was found that 98% of those trained could retain the information and technique of making the *labon-gur* mixture. The variation of sodium concentrations in the mixtures produced by the women, though wide, did not reach dangerous levels. The study concluded that programmes similar to this one would be suitable in other rural areas. The programme demonstrated that village women can learn oral therapy, including how to make oral solutions correctly from locally available substances using finger measurements. It also provides an example of a workable system to supervise and administer a rural health programme in a developing country based on achievement of educational objectives.

THE ROLE OF MOTHERS IN AN ORAL REHYDRATION PROGRAMME

Md. Yunus and J. Chakraborty, ICDDR,B

An oral therapy field trial was conducted in the Matlab Field Station of ICDDR,B to compare the acceptability, effectiveness and safety of two types of oral fluids delivered through a Maternal and Child Health and Family Planning Programme. The trial sought to answer the following questions :

1. What type of delivery system can effectively implement oral therapy at the village level in rural Bangladesh ?
2. Can mothers, supported by a village-based Health Worker, accurately prepare and use oral fluid ?
3. Will people use oral fluids for the treatment of diarrhoea ?

Diarrhoea cases in one group of 40,000 were treated with WHO oral rehydration salts packets, the second group of 40,000 were treated with locally available *labon* and *gur* measured with a specially made plastic spoon. A third group of 40,000 who received only hospital-based diarrhoeal treatment at Matlab treatment centre served as controls. Eighty Family Welfare Visitors were trained to teach *bari* mothers in each area to treat diarrhoea cases. Routine analysis of solutions prepared by the mothers showed their ability to prepare the appropriate solutions. Two sources assessed therapy effectiveness: field assistants who interviewed the *bari* mothers every two months recorded that 80% of all diarrhoea cases received oral therapy; and FWV records of their fortnightly visits showed that over 95% of the cases received oral therapy. The study concludes that mothers with little or no education and with some supervision can be taught about diarrhoea and its management.

VARIATIONS OF ORAL THERAPY VOLUME MEASUREMENT IN RURAL BANGLADESH

M. Shafiqul Islam, M.M. Rahaman, K.M.S. Aziz, Yakub Patwari and Mizanur Rahman, ICDDR,B.

An oral therapy field trial was held in Meheran and Monuharkhadi villages (population 6,000) in Matlab Thana, and Shamlapur village (population 7,000) in Teknaf Thana. Villagers were taught to provide oral rehydration salts to all cases of acute diarrhoea. Oral therapy powder was provided in 60 cc. bottles for dilution in 980 cc. or one *seer* of water. When properly mixed the solution contained 120 mEq/L of sodium. When these solutions were made by villagers and analysed it was found that the sodium concentration averaged 140 mEq/L for Matlab and 95 mEq/L for Teknaf. Sodium exceeded 140 mEq/L in 28 out of 71 samples in Matlab compared to 6 out of 54 in Teknaf. In the Matlab field trial the mean sodium levels decreased to 122 mEq/L ($p < 0.05$) when the *seer* volume used was measured and corrected at the onset of treatment. To determine if volumetric errors were responsible for high concentration in Matlab, a survey was carried out in four separate villages not involved in the trial. Of 128 households 111 had a measuring container. The mean *seer* volume was 959 cc. \pm 121 cc. (range 720–1270 cc.). 23% of the households with a measure produced a volume less than 90% of the correct volume. A similar procedure was applied in Teknaf. The mean *seer* volume was 926 cc. \pm 279 cc. (range 500–1500 cc.). Although correcting the *seer* volume seemed to produce more accurate sodium concentrations, these values did not correlate with actual volume of the measure as calibrated by the field workers in Matlab. Households using $\frac{1}{4}$ *seer* or *poa* measures produced more accurate volumes than did those using $\frac{1}{2}$ *seer* measures. The study concluded that in the absence of adequate training indiscriminate use of oral rehydration may expose a significant number of infants to the risks of hypernatraemia. Before oral rehydration salts are freely marketed or distributed in unsupervised settings the relative risks should be better defined in larger field trials.

A PRACTICAL ASSESSMENT OF INSTRUCTIONS FOR ORAL REHYDRATION PREPARATION

Douglas Huber, Bangladesh Fertility Research Programme and
Sneha Banu, Azimpur Maternity Centre

The basic instructions devised for the preparation of oral solutions were: in one glass (about 25 cc.) of pure boiled water dissolve one handful of sugar or *gur* and one large pinch of salt. Twenty-six Family Welfare Visitor trainees were given the instructions. After they made the oral solutions, concentrations were calculated on the basis of the individual trainee's pinch and handful quantities of salt and sugar. Results showed that the lowest sodium content was 55 mEq/L and the highest was 220 mEq/L. The average was 131. The UNICEF oralyte packets are 90 mEq/L. The average of 131 mEq/L is somewhat higher than most packaged oral therapy solutions, the upper range of 220 mEq/L being much higher than is normally recommended. From this data it was clear that with a larger volume measure the averages would bring down the extremes to a more sensible range. Instructions now indicate half a *seer* rather than one glass of water. As for sugar concentrations, a wide range was found. Usually 40 grams per litre, these solutions were nearly twice that. Apparently the FWVs did not understand the 3 finger scoop and the 2 finger pinch. Care should be taken to explain these adequately.

DIARRHOEAL MORTALITY IN TWO BANGLADESHI VILLAGES WITH AND WITHOUT COMMUNITY - BASED ORAL REHYDRATION THERAPY

M.H. Munshi, M. M. Rahaman, K.M.S. Aziz and Yakub Patwary,
ICDDR,B

The study took place in Teknaf Thana in the village of Shamlapur (population 7,021) which has no direct road link to the outside, and Bordil (population 3,888) which has two access roads to the Teknaf diarrhoea treatment centre seven miles away. Packaged oral rehydration salts were supplied to 18 depot holders in Shamlapur who were taught how to make and administer the solution. Villagers were informed of the availability of the ORS, as were the people in Bordil. Regular surveillance between January 1977 and December 1978 showed 1,757 episodes of diarrhoeal illness in Shamlapur and 939 in Bordil. Age specific diarrhoea attack rates in the two villages were comparable. In Shamlapur 73% used more than two packets and in Bordil 98% used one packet. Only 2% used the ORS more than once during one episode of diarrhoea. The overall rate of ORS consumption was 80% in Shamlapur and 38% in Bordil. The study concluded that there was a dramatic difference in diarrhoeal case fatality rates-there were eight deaths in Shamlapur caused by diarrhoea and 23 in Bordil, showing an overall case fatality rate of 0.5% and 2.4% respectively-in the two comparable villages in an endemic area where facilities for oral rehydration were available soon after the onset of diarrhoea. The other significant feature of the study was the spirit of self-help manifested through the active involvement and voluntary participation by the community.

THE ROLE OF ORAL REHYDRATION IN THE GOPALPUR NUTRITION PROGRAMME

Mohsin Ali Khan, USAID

The study was carried out with the organized rural women's groups (Mothers' Clubs of the Department of Social Welfare) in Tangail District. Four simple interventions were integrated in phases : (1) early introduction of solid foods; (2) frequent feeding; (3) oral rehydration; and (4) Vitamin A prophylaxis. Monthly weight for age measurement was used as an instrument of nutrition surveillance. At the end of one year growth charts of 61 children of A card holders (non-taxpayer families) were studied. The results suggest that the programme has considerable potential in affecting child malnutrition without changing income and other socio-economic factors.

INFLUENCE OF DISTANCE, SEX AND AGE ON UTILIZATION OF A DIARRHOEA CLINIC IN RURAL BANGLADESH

M.M. Rahaman, K.M.S. Aziz, M.H. Munshi, Yakub Patwary and Mizanur Rahman, ICDDR,B

A population of about 23,000 in Teknaf Thana was subjected to regular surveillance for three years for incidence of diarrhoea and dysentery as well as vital events like births, deaths and migration. Based on attendance at the laboratory-cum-study centre at Teknaf and weekly household surveillance it was possible to obtain an accurate estimate of the incidence of diarrhoeal diseases occurring in the communities. This information was used to analyse the impact of distance, age, sex and severity of illness on the attendance at the treatment centre. The study concluded that patients located more than three miles from the centre were less likely to attend unless the symptoms were severe. The difference in attendance between the sexes was low when distance was less than one mile but the gap widened sharply with increasing distance. For a distance of 2-3 miles there was a dramatic reduction in the attendance of the female patients. Male children were given more attention than female children at any given age.

CHOLERA EPIDEMICS OF CHANDPUR IN 1977 AND 1978 AND THEIR MANAGEMENT

K.M.S. Aziz, ICDDR,B

Advanced medical students and nurses from Dacca Medical College were trained at Matlab Hospital to operate independent treatment centres. Baburhat was set up between Chandpur and Matlab to train more doctors and paramedics and to treat patients. This kind of epidemic management can save many lives; death rates can be less than 0.5% with the availability of oral rehydration and intravenous therapy. Training local people and establishing temporary clinics in affected areas can be a powerful tool in saving lives and reducing cholera epidemics in Bangladesh.

THE ROLE OF VILLAGE PRACTITIONERS IN THE PRACTICE AND PROPAGATION OF ORAL REHYDRATION

A.S.G. Faruque, A.S.M. Mizanur Rahman and A. Bari, ICDDR,B

ICDDR,B started a community training project in Chandpur to train 95 village practitioners in diarrhoea management and related health education. The results of the study clearly indicated that these people can be motivated to undertake such a training programme and have the ability to understand and put it to effective use. Posttraining results showed that both hospitalization and mortality in cases treated by this trained group had gone down appreciably.

RECOMMENDATIONS

Operational Procedures (Implementation)¹

I. Production and Storage :

- A. The four NORP production centres should produce 5 million packets annually. The machine being imported should produce an additional 5 million packets. Conservative demand for ORS packets is 19 million for children under five years of age and 51 million for the total population. Alternate methods should be used when the packet is not available.
- B. The existing Ministry of Health logistics and supply system should be used to make the ORS packets available at the village level.
- C. ORS should have a minimum shelf life of three months, increased by :
 - 1. Using double polyethylene packets ;
 - 2. Keeping the sodium bicarbonate separately ;
 - 3. Storing at Thana Health Centres in boxes lined with calcium chloride.
- D. For effective quality control dehumidifiers and air conditioners are needed at the four production centres.

II. Delivery System :

- A. ORS packets need not be delivered by a paid village level health worker. In addition to current NORP delivery system, packets could be delivered by :
 - 1. Family welfare Assistants/Family Planning Assistants ;
 - 2. Traditional Birth Attendants ;
 - 3. Family Welfare Workers.
- B. A standard container to measure correct volume of water should be available to all Voluntary Village Health Workers.

¹ Implementation was defined as making oral therapy available when needed to individuals at village level.

III. Educational Component :

- A. Health Education Bureau resources should be used.
- B. School teachers should promote ORS.
- C. Voluntary Village Health Workers should be provided with a flip chart.
- D. Use of mass media should be restricted before NORP is in a position to satisfy needs for ORS.

IV. Programme Structure of NORP :

The present programme structure and staffing is inadequate to manage a programme of the intended size and should be strengthened.

Training Materials

- I. Training materials from other organizations in Bangladesh and other countries should be used as a baseline for developing materials for NORP.

II. ICDDR,B is developing materials to train :

- A. Professionals (doctors) ;
- B. Para-professionals (paramedics and *quacks*) ;
- C. Mothers and other villagers.

III. Trainees :

- A. Medical professionals ;
- B. Health Workers ;
- C. Family Planning Workers ;
- D. Union Council Chairmen ;
- E. Union Council Members ;
- F. Religious leaders ;
- G. Teachers ;
- H. Community leaders ;
- I. *Quacks* ;
- J. Nurses ;
- k. Mothers.

IV. Oral rehydration training :

- A. How to mix the ingredients ;
- B. How to administer the solution ;
- C. To whom it should *not* be given ;
- D. Nutritional advice.

V. Other things to be taught with oral rehydration :

- A. Motivation ;
- B. Preventive measures.

VI. Other specific issues :

- A. Information for mothers should be limited to 10 to 12 simple points for maximum retention ;
- B. Visual, audio-visual aids and local dialects should be used to train people who cannot read ;
- C. Training for professionals and non-professionals should be for five days ;
- D. Refresher courses for professionals should be one day each year ;
- E. Refresher courses for para-professionals should be one day each six months.

VII. Coordination of training materials development :

- A. A committee of people from different organizations involved in oral therapy.
- B. ICDDR,B should set up the committee.

Composition of Solutions

- I. ORS made with WHO formula is safe and effective, however, further research is needed to evolve an optimal solution for oral rehydration.
- II. There are questions that need to be answered by further research :
 - A. Is 90 mEq of salt per litre best ?
 - B. How important is it for the concentration of the various components to be exact ?
 - C. Should plain water be given as the child demands ?
 - D. What is the relation between the oral rehydration solution and malnutrition ?

Cottage Industry—Preparation of Packets ; Home-made Solutions and Quality Control of Cottage Industry and Home-made Solutions

- I. Consideration should be given to the importation of ready-made packets which have a longer shelf life and are now available at a reasonable cost. This is important considering that the locally produced packets would cost as much if the ingredients are expensive to buy initially and the plant laboratories have to be set up for their production.
- II. Production at the thana level to supply the needs of the thanas under the supervision of the compounder and the staff of the thana health complex would be suitable.
- III. The use of *gur* and other ingredients measured by approved spoons in home-made preparations should be considered as a life saving measure. An educational programme in the village communities would help people to prepare the solution. With the initiation of a primary health care scheme the Village Health Worker could be used as a resource person for this purpose.
- IV. The preparation of packets without sugar should be considered in order to increase the shelf life of the mixture. The sugar would be added when the solution is prepared.
- V. The preparation of packets containing a plastic container for measuring the solution should be given serious consideration providing cost allows.
- VI. The ICDDR,B laboratories should be extended to handle more packets if the cottage industry programme is expanded. However, a reasonably high standard of quality would be difficult to achieve under cottage industry conditions and it should seriously be considered that the packets be prepared at a central location, or, if the cost allows, to be imported.

Coordination and Evaluation

- I. A body should be formed to coordinate the various approaches to oral rehydration.
- II. Coordination in the form of control should be avoided.
- III. Information is needed to produce better health education materials for evaluation. Seminars and workshops are recommended as a way to gather information.
- IV. For an effective long-term coordination programme, the following are recommended :
 - A. Appoint a full-time coordinator to maintain contact with ORS projects in Bangladesh and act as an information/education person for the various groups.
 - B. Establish an information centre at ICDDR,B.
 - C. Approach international organizations for funds.
 - D. ICDDR,B should help in the exchange of knowledge and experience in other countries in the region.
- V. A uniform system of evaluation should be established to assess effectiveness of various ORS programmes in the country. The following areas should be evaluated :
 - A. Availability of the product.
 - B. Acceptance.
 - C. Usefulness.
 - D. Effectiveness.
 - E. Safety.
 - F. Cost.

GLOSSARY

BAZAAR	— A large village market.
BURQA	— A garment covering the head, face and body to achieve <i>pardah</i> .
GUR	— A solid concentrated sugar cane juice. When liquid this unpurified sugar is also known as molasses. <i>Gur</i> can be written as brown sugar or molasses.
HAT	— A small village market.
LABON	— Common salt.
ONE CHATTUCK	— One sixteenth of a <i>seer</i> or one fourth of a <i>poa</i> .
ONE POA	— One fourth of a <i>seer</i> .
PALLI CHIKITSHOK	— Village medical practitioner.
PURDAH	— A seclusion from strangers, particularly from males.
QUACKS	— Village medical practitioners including indigenous practitioners without any formal medical licence.
SEER	— One <i>seer</i> is equal to 0.93 kilograms
SWANIRVAR	— Self-reliance.

Bangladesh's 85 million people are divided into four divisions for administrative purposes. These four divisions are divided into 20 districts. There are 416 thanas within these 20 districts and these are divided into 4,500 unions, each union having three wards. The wards are made up of villages and there are 68,000 villages in Bangladesh.

ICDDR,B (CRL) publications can be obtained from Publication Unit, International Centre for Diarrhoeal Disease Research, Bangladesh, G.P.O. Box 128, Dacca-2, Bangladesh.

A. CRL Annual Report 1976.

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B. Working Paper :

No. 1. The influence of drinking tubewell water on diarrhoea rates in Matlab Thana, Bangladesh by George T. Curlin, K. M. A. Aziz, M. R. Khan. June 1977 (Rep. Sept 1978). 21 p.

No. 2. Water and the transmission of El-Tor cholera in rural Bangladesh by James M. Hughes, John M. Boyce, Richard J. Levine, Moslemuddin Khan, George T. Curlin. Dec 1977 (Rep. Mar 1980). 27 p.

No. 3. Recent trends in fertility and mortality in rural Bangladesh 1966-1975 by A. K. M. Alauddin Chowdhury, George T. Curlin. Jan 1978 (Rep. Oct 1979). 14 p.

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