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Date 21-July 1986

27 / 26

ETHICAL REVIEW COMMITTEE, ICDDR,B LIBRARY

Principal Investigator A. BRIEND V. FAUVEAU

Trainee Investigator (if any)

Application No. 86-024

Supporting Agency (if Non-ICDDR,B)

Title of Study EVALUATION OF THE MATLAS

Project status:

NUTRITION REHABILITATION UNIT BY

(L) New Study

ASSESSMENT OF DEATHS AVERTED AND COSTS

() Continuation with change
() No change (do not fill out rest of form)

Circle the appropriate answer to each of the following (If Not Applicable write NA).

Source of Population:

- (a) Ill subjects Yes No
- (b) Non-ill subjects Yes No
- (c) Minors or persons under guardianship Yes No

Does the study involve:

- (a) Physical risks to the subjects Yes No
- (b) Social Risks Yes No
- (c) Psychological risks to subjects Yes No
- (d) Discomfort to subjects Yes No
- (e) Invasion of privacy Yes No
- (f) Disclosure of information damaging to subject or others Yes No

Does the study involve:

- (a) Use of records, (hospital, medical, death, birth or other) Yes No
- (b) Use of fetal tissue or abortus Yes No
- (c) Use of organs or body fluids Yes No

Are subjects clearly informed about:

- (a) Nature and purposes of study Yes No
- (b) Procedures to be followed including alternatives used Yes No
- (c) Physical risks NA Yes No
- (d) Sensitive questions NA Yes No
- (e) Benefits to be derived Yes No
- (f) Right to refuse to participate or to withdraw from study Yes No
- (g) Confidential handling of data NA Yes No
- (h) Compensation &/or treatment where there are risks or privacy is involved in any particular procedure Yes No

5. Will signed consent form be required:

- (a) From subjects Yes No
- (b) From parent or guardian (if subjects are minors) Yes No

6. Will precautions be taken to protect anonymity of subjects

Yes No

7. Check documents being submitted herewith to Committee:

- ___ Umbrella proposal - Initially submit an overview (all other requirements will be submitted with individual studies).
- ✓ Protocol (Required)
- ✓ Abstract Summary (Required)
- ___ Statement given or read to subjects on nature of study, risks, types of questions to be asked, and right to refuse to participate or withdraw (Required)
- ___ Informed consent form for subjects
- ___ Informed consent form for parent or guardian
- ___ Procedure for maintaining confidentiality
- ___ Questionnaire or interview schedule *

* If the final instrument is not completed prior to review, the following information should be included in the abstract summary.

1. A description of the areas to be covered in the questionnaire or interview which could be considered either sensitive or which would constitute an invasion of privacy.
2. Examples of the type of specific questions to be asked in the sensitive areas.
3. An indication as to when the questionnaire will be presented to the Cttee. for review.

(PTO)

I agree to obtain approval of the Ethical Review Committee for any changes involving the rights and welfare of subjects before making such change.

for: A Briend V Fauveau
Principal Investigator

Trainee

REF
WS 115.JB2
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1986

86-024

27/7

Section-I : Research Protocol

Title:

EVALUATION OF THE MATLAB NUTRITION REHABILITATION UNIT
BY ASSESSMENT OF DEATHS AVERTED AND COSTS.

Principal Investigators: A Briend, V Fauveau

Co-Investigators: M Yunus, R Khanum, S Ara, J Chakraborty

Consultants: MGM Rowland, D Balk

Starting date: August 1986

Completion date: 2 years from starting date

Scientific Programme Head: MGM Rowland

This protocol has been approved by the Community Services
Research Working Group

Signature of the Scientific Programme Head:

Date: _____

23/7/86

ABSTRACT SUMMARY

The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) has recently started a small Nutrition Rehabilitation Unit (NRU) at its Matlab Diarrhoea Treatment Centre. It is unlikely, in the initial phase, that all malnourished children requiring treatment can be accommodated. Before expanding such a facility, its value needs to be established.

Children treated in the NRU and two cohorts of control malnourished children will be followed for one year. One control group will consist of malnourished children discharged from the Matlab Diarrhoea Treatment Centre just after their diarrhoea is over. The second group will consist of severely malnourished children detected in the community who could not be admitted for nutritional rehabilitation. Differences in the number of deaths occurring in these groups will give an estimate of the number of deaths averted by the NRU every year. The cost of each death averted will be determined for further comparison with other health interventions.

Reviews:

Ethical Review Committee: _____

Research Review Committee: _____

Director: _____

SECTION II: RESEARCH PLAN

A. INTRODUCTION

1. Objectives

To determine whether malnourished children treated in a Nutrition Rehabilitation Unit experience reduced mortality compared with untreated malnourished children.

To estimate the cost of each death averted by the Nutrition Rehabilitation Unit.

2. Background

In Bangladesh, malnourished children discharged from hospital after treatment for diarrhoea have an increased risk of death during the following three months (1). In this context one could argue that

(i) if they had been fed a few more weeks until their nutritional status returned to normal, their deaths could have been averted or

(ii) the environmental factors underlying their diarrhoea and malnutrition were encountered again on their return to the community and the inevitable fatal outcome was only delayed by hospital treatment.

The practical implications of these two hypotheses are diametrically opposed. Unfortunately, few studies have examined the long term effect of nutrition rehabilitation, and its impact on mortality has never been adequately assessed (2).

The concept of nutrition rehabilitation, developed in South America by Bengoa (3), received much attention after it was realised that treatment of malnourished children in general hospital wards gave poor results and was very expensive (2). In a review of data published between 1956 and 1969, Cook showed that the mortality of malnourished children in hospitals varied between 20% and 40%, which was apparently higher than the mortality of untreated children (4). More recently, hospital treatment of malnourished children has placed more emphasis on anti-infectious therapy as well as high-energy feeding, greatly reducing these figures. Nevertheless, Cook's concern about the cost of hospital treatment remains valid: if all severely malnourished children were to be treated in a conventional ward, this would consume the entire health budget of many developing countries (5). A cheaper alternative, concentrating on children with a high risk of death, has to be found.

Nutrition rehabilitation units (NRUs) were supposed to provide the answer. The aim is to educate mothers by involving them in feeding their malnourished children back to health using locally available, traditional foods in low cost treatment units (4).

Several attempts have been made to evaluate the effectiveness of nutrition rehabilitation. Most authors measured weight gain achieved and found that it was consistently above the rate expected for children of the same age (2). This finding, however, is not conclusive since these malnourished children may have been recovering from an infection and following recovery

might have had the same catch-up growth with the traditional family diet. Ideally, treated children should be compared with untreated controls (6). This raises ethical problems and can be done only in very few situations. A study with pair-matched controls by Hegin et al (7) showed greater weight gain in treated children. However, sample size was small and the results after a 4 month follow-up period were inconclusive. More recently, in Saint Lucia, it was shown that children who received intensive feeding before being discharged from a paediatric ward had no long term benefit in terms of nutritional status, compared with randomly selected controls who left the hospital just after their acute illness was over (8). This emphasises the need for control studies.

Even if most previously claimed positive results were valid their relevance is still open to question: the real question is whether the weight gain achieved was functionally and not just statistically significant (9). Unfortunately, no functional benefit, such as reduced mortality, has ever been clearly shown to be associated with these improvements in nutritional status. In the only study which suggested that nutrition rehabilitation may prevent deaths (Table 1) (6), treated children and controls were not matched and it was unclear to what extent the observed differences were attributable to nutrition rehabilitation.

Just as the hospital treatment of malnourished children has improved substantially over the years, recent advances may well have increased the effectiveness of NRU's and a new evaluation, based on functional outcome, is timely (2).

TABLE 1

Comparison of the number of deaths in treated and untreated malnourished children from Nutrition Rehabilitation Units in Haiti and Guatemala (ref.6).

Survival after 9 month follow-up	Haiti		Guatemala	
	Alive	Died	Alive	Died
Children treated in NRU	115	5	100	1
Comparison children	21	5	21	3

Difference between the 2 groups are significant at the 0.05 level (Fisher's exact test). Statistical analysis not presented in the original paper.

The Matlab NRU will be started on a small scale initially and will accomodate no more than 20 children a month. A recent informal survey among Community Health Workers (CHW's) suggested that there might be 250 children, in the Matlab MCH-FP intervention area alone (population = 90 000), having a serious degree of malnutrition (10). A previous survey in Matlab suggested that 1% of all under 5 children have an arm circumference less than 100 mm (11) which gives another estimate of about 150 severely malnourished children qualifying for admission to the NRU. Thus it seems unlikely, initially, that the unit will be able to treat more than about 20% of severely malnourished children. In this situation, the outcome of untreated malnourished children may be compared with the treated group to estimate the number of deaths averted by the NRU.

By documenting the costs of the NRU it will also be possible to calculate the cost of each death averted. Current information on the cost of deaths averted by nutrition interventions is based on large scale food supplementation programmes (12, 13). These are expensive (around US\$ 3000 for 1 to 4 year old children) and totally impractical for many developing countries. Substantially lower costs would enable the rehabilitation of malnourished children to be realistically ranked among the higher priority interventions.

3. Rationale:

- The effectiveness of nutrition rehabilitation in reducing mortality of severely malnourished children has been inadequately investigated.

- Even if effective, some measure of the costs involved for each death averted should be estimated before advocating this as a high priority health intervention.

B. SPECIFIC AIMS

- To follow a cohort of severely malnourished children who were treated in a NRU and two cohorts of matched controls.

- To construct life tables and determine whether there are significant differences in outcome between the treated and control groups.

- To estimate the cost of deaths averted by nutrition rehabilitation.

C. METHODS OF PROCEDURE

1. Study area.

Since 1963, the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B), formerly the Cholera Research Laboratory, has been conducting a health-oriented research programme in Matlab Upazila, Chandpur District, a rural area of Bangladesh (14). Matlab is located about 45 km from Dhaka, the country's capital. The 149 villages now under surveillance have a population of 191,000. Since October 1977, the data collection has been modified in conjunction with the development of a village-based Maternal and Child Health and Family Planning (MCH-FP) Programme in 70 villages. The remaining villages are referred to as "comparison" villages.

In Matlab-bazaar itself, ICDDR,B is operating a Diarrhoea Treatment Centre. The NRU which will be the subject of this study is attached to the Diarrhoea Treatment Centre.

2. Selection of patients.

Patients enrolled in the study will come from the part of the Matlab area under ICDDR,B's Demographic Surveillance System, namely the MCH-FP intervention and comparison areas. Children between 6 and 48 months old and with an arm circumference below 100 mm will be eligible for inclusion. Children who do not fulfil these criteria may also be admitted to the NRU if considered necessary by the MCH-FP medical officer.

A lower age limit is stipulated because of the restricted scope for treating young malnourished infants with locally available food. Children who are more than 48 months will no longer be under routine MCH-FP surveillance. Screening children using arm circumference has the advantages of being closely related to the risk of death (11) and of being readily carried out in the community.

The cut-off point of 125 mm of arm circumference conventionally used for defining severe malnutrition (15) seems inappropriate for rural Bangladesh. Approximately 10% of under 5 children are below that limit (16); if this criterion were used 1500 children in the Matlab MCH-FP area would have to be referred for treatment, which is well beyond our intervention capacity. Moreover, mortality of these children is substantially lower than in the under 100 mm category, which should therefore be the basis for referral (11).

The same cut-off point will be used between 6 and 48 months. A recent hospital study suggested that arm circumference uncorrected for age is a good estimator of the risk of death even outside the 1-4 year age range (17).

Children will be admitted to the Matlab NRU from two sources. One group of malnourished children will be referred from the adjoining Diarrhoea Treatment Centre after their diarrhoea is over; another group will be referred directly from the community. CHW's who currently visit every family in the MCH-FP area fortnightly will be asked to screen children under 4

years and to refer to the NRU those with an arm circumference below 100 mm. The proportion of patients coming from the Diarrhoea Treatment Centre and from the community is not predetermined and will depend partly on patient perceptions and compliance. If, as expected, the NRU is unable to accommodate all those requiring treatment, selection of patients will be made by the MCH-FP physician on the basis of severity, regardless of source.

3. Selection of controls

Random allocation of malnourished children to a control and a treatment group is impractical and unethical as, scientifically speaking, randomisation should take place only after the family has agreed to have the child admitted, effectively amounting to withdrawing an offer of treatment just given. For this reason the survival of two groups of untreated children will be used for comparison with treated malnourished children. One source will be children leaving the Diarrhoea Treatment Centre without nutritional rehabilitation either because there was no accommodation available or because treatment was refused. Another group will be severely malnourished children detected in the community in the MCH-FP area, who also could not be accommodated or would not accept treatment. Two controls will be selected for each case, in order to minimize the risk of losing a pair of subjects for analysis in case one of the controls is later admitted at the NRU. The reason for which the controls have not been admitted at the NRU will be clearly identified (i.e. due to the

patient or due to the lack of space at the NRU), in order to control for the potential bias attached to this factor.

Each subject and controls (one from each group) will be matched for variables likely to affect long term growth or survival. One will be nutritional status, using arm circumference for community controls, arm circumference and weight-for-age for those from the Diarrhoea Treatment Centre. Another will be sex and age to the nearest 3 month. Treated children from the Diarrhoea Treatment Centre will have DTC controls from the same MCH-FP or Comparison area. If it is impossible to match controls exactly they will be selected from the less severely malnourished children. To avoid the confounding effect of seasonality, control subjects should be identified within 1 month of the study subject. Whenever possible matching for socio-economic characteristics will be done.

4. Management of patients in the Nutrition Rehabilitation Unit.

Patients admitted to the NRU will be treated by frequent high-energy, high-protein feeds (18-20). Feeds will be prepared with cheap, locally available foods. During the first few days a liquid formula made of rice powder, dried skimmed milk, vegetable oil and sugar will be given to children who cannot eat solid food, moving towards an adult type solid diet as soon as possible. Children will be fed ad libitum to ensure maximum energy intake (21) and the exact quantity of food consumed will not be measured routinely in every child. Weight gains comparable to those obtained in hospital with fixed feeding

regimes has been achieved in units where children were simply fed ad libitum two hourly (22).

In addition to dietary therapy, children will be given any treatment needed for associated infections.

NRU staff will involve mothers in the preparation of meals and give them informal nutrition education, mainly by encouraging interaction between newcomers and mothers of successfully rehabilitated children. Other activities, such as sewing, will also be encouraged.

Children will be discharged as soon as they fulfil three conditions

- (a) appetite has returned to normal
- b) weight gain is sustained
- c) any infection has been treated

No attempt will be made to reach predetermined weight-for-age or weight-for-height.

5. Follow-up

All study children will be followed up by CHW's who already make fortnightly visits to the household of every eligible child. They will inquire about the health of the child, informally giving advice on nutrition and health as needed. If the child does not improve between one visit and the next they will again be referred to the NRU and the supervisor notified.

In the MCH-FP area, the weight of children who were treated

will be measured with a portable scale, monthly for 6 months and then yearly.

In the comparison area no anthropometric measurements will be made. All deaths and out-migrations are routinely recorded throughout the study population. Thus life tables of treated and comparison groups can readily be constituted.

The cost of the NRU will be estimated by routine methods (23). Capital costs, incurred in starting the NRU have been recorded. Their annual cost can be computed from the estimated life expectancy and interest rate. Recurrent costs needed for the operation of the NRU (salaries, supplies transport etc....) will be estimated using records in routine use. Costs incurred by the patient and family will not be measured. The monthly exchange rate of the Taka against the US Dollar will be used through the study period to correct for possible devaluation and to allow international comparisons.

6. Duration of follow-up

The study of post-diarrhoeal mortality of malnourished children in Matlab (1) showed that of deaths in the year following hospital admission 50% occurred in the first month and 70% in the first three months. Thereafter the death rate was similar to that of other children of the same age group. The same pattern has been observed in Nepal (24). This suggests that a one year follow-up period should be ample to determine if the nutritional rehabilitation unit affects survival.

7. Determination of the cause of death during follow-up

When a death occurs in the treatment or the comparison group an attempt will be made to determine its cause following the routine procedure in Matlab. If a death is clearly unrelated to the child's nutritional status, (such as drowning), the case may be excluded from the final analysis.

8. Power of the study

The power of this study can be defined as the probability that it will show a significant difference on survival of the treated and the untreated subjects. It can be calculated by inverting the formula used for the calculation of the sample size (25). This is desirable where sample size is limited by practical constraints and cannot be readily measured.

The power of this study depends on the number of children treated and on the numbers dying in the treated and the comparison groups. This is currently unknown. Table 2 gives an estimate of the power of the study given by different hypotheses. The estimate of the number of deaths in malnourished children was derived from previous community studies (1,11). the calculator shows that if 10 to 20 children are treated every month, the study will have a reasonable probability of yielding a significant result within 2 years, especially if mortality is reduced by 50%, as experienced in Central America.

TABLE 2

Estimate of the power of the study to detect a difference of survival between treated and untreated children significant at the 0.05 level

	hyp 1	hyp 2	hyp 3	hyp 4	hyp 5	hyp 6
Number of treated children	480	240	480	240	480	240
Deaths in control group (%)	15	15	15	15	15	15
Deaths in treated group (%)	10	10	7.5	7.5	5	5
Power of the study (%)	65	38	96	74	99	96

9. Statistical analysis, interpretation of results

After two years of study the matched treatment and comparison groups will be tested for confounding variables which may influence survival. Life tables for treatment and comparison groups will then be graphed: this will show whether or not risk of death decreases rapidly with time as shown previously in Matlab (26). The numbers of children surviving at 6 and 12 months will then be compared by a chi-square test (or a Fisher's exact test if needed) (27) and a log rank test more suited for analysis of survival will be done (26). To determine which factors other than treatment have influenced the risk of death, a logistic regression with all potential predictors will be run (27).

D. SIGNIFICANCE

This study will give an estimate of the cost of every death averted through nutritional rehabilitation. This evaluation will help to determine the importance of this intervention, as compared with other alternatives.

E. LIMITATIONS OF THE STUDY

It is understood that if the study shows a positive impact of the NRU on child survival, it may be only temporarily and may be due to the fact that NRU can afford to offer better food, whereas poor families in Bangladesh usually cannot. For this reason it is pointed that only available and cheap food is offered in the NRU, and emphasis is put on education of mothers to provide similarly available and cheap food to their children at home.

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ABSTRACT SUMMARY FOR ETHICAL REVIEW COMMITTEE

1. This protocol aims at determining the cost of every death averted by a Nutritional Rehabilitation Unit about to be started in Matlab. Every treated child will be followed along with two matched controls who will remain untreated as a result of the limited turn over of the unit.
2. This protocol will not interfere with the treatment of malnourished children at ICDDR,B's Matlab treatment centre. It involves no risks to patients.
3. Non applicable
4. The confidentiality of data collected will be maintained throughout the study and only a coded identification number will be used during analysis of data.
5. Informed consent will not be asked. All the information needed for this protocol will be taken from data routinely collected for service.
6. It is hoped that mortality will be substantially decreased in the group of children admitted for treatment.
7. The study requires the use of hospital records. No organs, tissues or body fluids will be used.

MATLAB NRU COST EFFECTIVENESS PROTOCOL

BUDGET

3100 LOCAL SALARIES	Effort %	Monthly salary	Nb	Origin of funds	
				External	ICDDR,B
Manager Health Services	10	430	1	516	0
MCH-FP Medical Officer	20	430	2	2064	0
Senior Health Assistants	50	162	2	1944	0
Clerk /Data entry technician	20	140	1	336	0
Administrative Assistant	50	140	1	840	0
Coder	25	140	1	420	0
Clinic Attendant	100	110	1	1320	0
Cleaners	10	110	2	264	0
Community Health Workers	100	95	6	6840	0
Total for first year				14544	0
Estimation for 2nd year (+15%)				16726	0
Subtotal				31270	

3200 INTERNATIONAL SALARIES

Position	Effort %	Yearly salary		Origin of funds	
				External	ICDDR,B
Dr Briend, MD, Nutritionist	20	38000	*	0	7600
Dr Fauveau, MCH-FP physician	20	38000		0	7600
Total for first year				0	15200
Estimation for 2nd year (+15%)				0	17480
Subtotal				0	32680

* Estimation. Salary funded by French Government.

3700 SUPPLIES AND MATERIAL

	Origin of funds	
	External	ICDDR,B
Food (child + attendant)	4500	0
Drugs	2500	0

Diskettes for microcomputer, paper, ribbons	200	0
Stationery	200	0
Total for first year	7400	0
Estimation for 2nd year (+15%)	8510	0
Subtotal	15910	

4800 INTERDEPARTMENTAL SERVICES

Origin of funds

External ICDDR,B

ICDDR,B transport to Matlab		
10 per year @ Takas 500 each	180	0
Patient referral	600	0
Xeroxing	200	0
Laboratory	1000	0
Total for first year	1980	0
Estimation for 2nd year (+15%)	2277	0
Subtotal	4257	

0300 CAPITAL EXPENDITURE

Origin of funds

External ICDDR,B

Weighing scale	150	
Cooking utensils	60	
1 Sewing machine	200	
8 Wooden beds	80	
2 Cupboards	200	
Total	690	

TOTAL DIRECT COSTS	84117
OVERHEAD (31%)	26076
TOTAL OPERATING COST	110193
TOTAL PROJECT COST	110883
ICDDR,B CONTRIBUTION (Including overhead)	58756
AMOUNT NEEDED	52127

ANNEX

MATLAB NUTRITION REHABILITATION UNIT
GUIDELINES FOR OPERATION

FACILITIES, EQUIPMENT, SUPPLIES.

FACILITIES

- For exclusive use of NRU patients, their attendants and staff:

- 1 NRU ward
- 1 toilet w/ shower
- 1 kitchen and demonstration room
- 1 store room

- plus, for use of other attendants, relatives and visitors:

- 1 attendant room, located besides the canteen

- In addition, the MCH ward could be used temporarily, as isolation room for example.

EQUIPMENT

- platform beds
- almirah for storage
- desk for staff
- folding bed for staff
- chairs
- stools
- gas stove
- kerosene stove
- cooking pans
- buckets

FACILITIES, EQUIPMENT, SUPPLIES

STAFF AND JOB DESCRIPTION

- For exclusive use of NRU patients, their attendants and staff:

6 COMMUNITY HEALTH WORKERS

Full time, take shifts of 6 hours, including nights, roster to be prepared by Administrative Assistant. One CHW for night duty, two for day duty.

There are 3 day shifts of 6 hours (6 to 12 am, 12 to 6 pm, 4 to 10 pm), and one shift of 8 hours (10pm to 6am)

They prepare food with the help of mothers, help feeding the children, help and teach mothers on feeding and keeping good hygienic practices, inform and motivate mothers. They keep the premises clean at all times.

They take and record weights every morning, plus temperature, respiratory rate and pulse, as well as other anthropometric measures, and clinical signs (oedema, diarrhoea, vomiting, respiratory signs, anemia...)

She is responsible to the FWV.

1 CLINIC ATTENDANT

Part-time, sharing with MCH clinic
She takes vital signs, (temperature, pulse, respiratory rate...), she manages medical treatments, medications, injections infusions, dressing of skin sores...
She also acts as CHW whenever necessary, and is responsible to the FWV

2 FEMALE SENIOR HEALTH ASSISTANTS (FAMILY WELFARE VISITORS)

Part time, sharing with MCH clinic. They supervise the job of CHWs and clinic attendant, they supervise ward management, food preparation and cleaning. They train CHWs and mothers, ensure communication with patients, assist in solving individual problems. They examine patients and screen for complications. They motivate and prepare for follow-up after discharge. They ensure quality of data on patient charts. They also supervise mothers' activities: sewing, literacy classes, health-related talks... They are responsible to the MCH physician for medical issues.

1 HEALTH ASSISTANT

Part time, sharing with MCH clinic. She organizes and prepare cooking and feeding demonstrations. She prepares rosters for the staff. She ensures quality of data collection and of follow-up. She ensures flow of supplies, orders food and supervises storage. She keeps record of all expenses. She liaises with field teams for follow-up. She is responsible to the manager of Health Services

1 MCH PHYSICIAN

Part time, sharing with MCH clinic and MCH field programme. She examines every patient every day, as well as mothers or attendant whenever necessary. She checks for complications and treat or refer accordingly. She is overall responsible for good communication with patients. She decides for discharging. She supervises FWVs and trains them on the job.

2 CLEANERS

Part time, they keep the premises clean, and support the activities according to the needs.

TRAINING

In addition to their formal training, each category of staff has spent some time in Dhaka, at the ICDDR Nutrition Unit, at the SCF Nutrition Unit, and at the Shishu Hospital Nutrition Unit.

Training at every level of work at the NRU should refer to the 5 (five) main messages, or categories of messages:

SCREENING MALNUTRITION:

By measuring weigh, length, arm circ.
By physical examination: oedema, anemia, signs of vitamin A deficiency, skin lesions, ...
By checking chronic diseases and developmental problems, including behavioral problems

FEEDING A MALNOURISHED CHILD:

Focusing on quantities (quantity of

feeds, quantity of food, quantity of calories) rather than on quality (being implied that most of the time, high quality foods are not available or beyond purchasing capabilities of affected families). Also focusing on locally and seasonally available food. Edible oil can always be added to children diet.

IDENTIFYING RISK FACTORS OF MALNUTRITION:

Individual factors such as infections, diarrhoeas, respiratory diseases, measles, parasitosis, TB, malformations, twins,...

Maternal factors, such as absence or sickness of mother, failure of lactation, delayed introduction of semi-solid food, inappropriate use of bottle feeding, illiteracy, too young or too old age,...

Environmental factors, such as use of surface water, poor hygienic practices,...

ADDRESSING THOSE RISK FACTORS, PREVENTING, EDUCATING

Identify, treat, refer complications, promote the use of soap and handwashing, immunize through EPI, encourage colostrum and breast feeding even if the mother is felt to be sick, motivate for birth spacing, educate on home management of common illnesses, promote income generating activities, etc...

FOCUSSING ON ATTITUDES AND COMMUNICATION

Most of the time, mothers or attendants are not used to come to a hospital, to meet unknown people, to be asked many personal questions, and they do not feel comfortable. One of the aims of the programme is to make mothers feel comfortable, and to encourage them to stay as long as possible in the NRU, for the benefit of their child's health. Therefore, it is necessary to insist on a good, positive, warm, and encouraging attitude whenever talking to them. The success of the whole programme may depend on a major part on the way mothers are convinced by all levels of workers to stay long enough at the NRU, and to accept follow-up activities.

ADMISSION PROCEDURE

Whenever there is room available in the ward, the question of priorities does not arise. But when space is limited, the following patients will be admitted in order of priority:

- patients referred by the FIELD, and living in the MCH Area,
- patients referred by the diarrhoeal WARD, living in the MCH Area
- patients referred by the diarrhoeal WARD, living in the Comparison Area
- patients referred by the FIELD, and living in the Comparison Area
- other patients

Upon admission, an Individual Patient's Chart will be filled, and an

admission number will be attributed, by order of admission. If a patient is admitted for the second time, he will be treated as a new admission, but the charts will be pooled. Special attention will be given to such cases.

The weight on admission will be written in clear on the second broad line from the bottom of the weight chart, and each line will be considered as a unit of 100 g. (precision in weighing will be of 50 g., the nearest 50 g will be used)

A new chart will be used every month.

Weights are expressed in Kg and grammes (g.), arm circumferences in millimeters (mm.), heights in centimeters (cm.) and temperatures in Fahrenheit (F)

Past history (page 2 of Patient's Chart) is recorded by the MCH physician.

FEEDING PROCEDURE:

As a principle, local foods prepared with local ingredients and according to local recipes are given preference. Emphasis is on number of feeds per day (8 to 12, according to age, and on caloric value of foods.

Some samples of diets are given below:

DIET FOR MALNOURISHED CHILDREN WITH DIARRHOEA (After 6 months)

Watery diarrhoea		Non watery diarrhoea	
Dehydration	No dehydration	No Oedema	Oedemas
ORS +	Breast milk +		Breast milk +
Breast milk only.	1/2 strength suji, ad libitum 9 times a day		Full strength suji, ad libitum 9 times a day
If dehydration severe, refer to Diarrhoea Treatment Centre	+		+
	solid food, ad libitum 4 times a day		solid food, ad libitum 4 times a day

DIET FOR MALNOURISHED CHILDREN WITHOUT DIARRHOEA (After 6 months)

Oedemas	No oedemas
Breast milk +	Breast milk +
Full strength milk suji, 9 times a day, ad libitum *	Full strength milk suji, 9 times a day, ad libitum
+	+
Salt free solid food ad libitum.	solid food ad libitum.

MOTHERS' ACTIVITIES

Mother (or any other female attendant) should be a focus of interest from the part of the NRU staff. The objective is to provide her with enough knowledge and practice to be able to feed her child optimally at home. All efforts should be directed towards making her understanding the main health issues, and keeping her busy during her stay at the NRU.

Mothers will participate in:

- cooking and feeding activities,
- cleaning premises and equipment

but also:

- discussions on health-related topics (see samples of topics and teaching methods), twice a day
- literacy classes
- discussions on home-economics
- sewing
- fishing-nets making
- baskets or mats weaving
- etc

Male attendants, encouraged to visit the NRU in the daytime, will also receive attention from the part of the staff.

MEDICAL INTERVENTION IN CASE OF COMPLICATION

During the regular working hours, one of the MCH-FP Physicians is responsible for the NRU. Otherwise the Medical Officer on duty is responsible. The Clinic Attendant is in principle the most appropriate person for applying medical prescriptions, she may be helped by the CHW on duty, and anyway she is supervised by the FWV.

Upon Physician's decision, the patients with severe complications may be transferred to the following places:

- Diarrhoea with severe dehydration: to the Diarrhoeal Ward
- Acute Respiratory Infection with need of Oxygen: to the Ward
- Contagious disease (Measles, chickenpox, open TB,...): to the MCH Ward
- Contagious diarrhoea: to the Diarrhoeal Ward or the MCH Ward
- etc...

Drugs and medical supplies are provided by the MCH clinic but account is kept of of all consumed items on the NRU register.

The MCH physician may also prescribe laboratory tests or X-rays, using the same procedure and forms as in the diarrhoeal ward or in the MCH clinic.

DISCHARGE PROCEDURE

The decision for discharging a patient is usually taken by the MCH physician, based upon consideration of time spent at the NRU, weight gained, health status, mother's status, and other (external) constraints.

In any case, discharge is monitored by the Administrative Assistant, who is also responsible for follow-up.

A referral form of the same model as the one used in the MCH programme is sent to the corresponding field CHW, and to the FWV (LFPV) of the sub-centre (if in the MCH

FOLLOW-UP

- Frequency of visits: once a month, but the first visit will take place after 15 days.

- Duration of follow-up: at least 6 months, at best one year

- Place: at home during regular home visits by field CHWs, or at the sub-centre if patients live close enough, (or if they require physical examination and treatment)

- By whom?: usually by the CHW in charge of the area, sometimes by the LFPV of the sub-centre, sometimes by one of the CHWs of the NRU (specially for children living in the Comp. Area)

- Procedure: after taking information about the general condition and the feeding habits of the child, a quick physical check-up (anemia, oedemas, eye signs, abdomen and skin condition) and current weight is measured, by means of the light spring scale available at the sub-centre.

- Transfer of data is done at the sub-centre meeting, FRQ subsequently will bring the information to the Administrative Assistant for entering it into the individual file.

- Here again, emphasis should be put on attitude, communication and motivation, some mothers may have reasons to mistrust the programme, and to refuse follow-up, the success of the evaluation depends on the good relationship that all workers may have established with the families from the beginning of the programme.