A DESIGN AND FIELD METHODS FOR MONITORING IMPACT ON MORTALITY OF AN ORAL THERAPY PROGRAMME

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PREFACE

The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) is an autonomous, international philanthropic and non-profit centre for research, education and training as well as clinical service. The Centre is derived from the Cholera Research Laboratory (CRL). The activities of the institution are to undertake and promote study, research and dissemination of knowledge in diarrhoeal diseases and directly related subjects of nutrition and fertility with a view to develop improved methods of health care and for the prevention and control of diarrhoeal diseases and improvement of public health programmes with special relevance to developing countries. ICDDR,B issues annual report, working paper, scientific report, special publication, monograph, thesis and dissertation, and newsletter which demonstrate the type of research activity currently in progress at ICDDR,B. The views expressed in these papers are those of authors and do not necessarily represent views of International Centre for Diarrhoeal Disease Research, Bangladesh. They should not be quoted without the permission of the authors.

ABSTRACT

This paper provides a design and field methods for monitoring the impact on mortality of an Oral Therapy Programme undertaken by the Bangladesh Rural Advancement Committee in five districts of Bangladesh. The aim is to set up a low cost surveillance system that can detect changes in mortality due to diarrhoea in the 1 - 4 age group. The design envisages a double stratification of thanas (one geographic and one on the basis of "famine liability"), a sliding selection of two unions from each of four strata. A baseline survey in each union followed by retrospective multi-round surveys in the selected unions have been planned.

BACKGROUND

Beginning in 1972 the Bangladesh Rural Advancement Committee (BRAC) has been working for the social and economic uplift of the rural poor of Bangladesh. BRAC, a private voluntary organization, works through small projects in different areas of Bangladesh. Health is one aspect of a complex of developmental activities.

In mid-1980, BRAC decided to include within its health education programmes, the knowledge about oral rehydration therapy for diarrhoea. BRAC through its activities recognised some difficulties with the WHO advocated ORS packets (27) and the spoon measurement techniques (21) for the treatment of diarrhoea. These difficulties included availability of the packets. It thus formulated a health message after nearly a year of research and field trials. The message called the TEN POINTS TO REMEMBER is a concise summary of information that a villager needs to know to treat diarrhoea with oral therapy in his/her own house (See Appendix I). The ten points explain how to prepare and use the *lobon-gur* oral saline and includes some relevant nutritional advice. *Lobon-gur* oral saline is an oral replacement mixture. *Lobon* is Bengali for common table salt which is sodium chloride. *Gur* is locally available unrefined sugar which is sucrose. *Gur* also contains potassium in approximately the proper proportions (about onetenth) to sucrose (i.e. when the *lobon-gur* mixture contains approximately 110 mmol/L of sucrose, it also contains 10 and 20 mmol/1 of potassium). The saline is prepared by adding a three-finger pinch of *lobon* to a four finger scoop of *gur* in one half seer (467 cc) of tubewell or boiled water followed by stirring.

In 1979 BRAC carried out a pilot programme in three thanas of Sylhet district. A total of about 40,000 households were visited and taught the "ten points". On the basis of experiences of the pilot programme (6), BRAC in July 1980 decided to extend its programme.

According to this extended programme, five districts covering a total of 3.5 million households will be visited during 1980-83 for the teaching (3). The core workers of the programme are the oral replacement workers (ORW). They are females mostly in their twenties with secondary level education. Details of the programme are to be found in (3).

The ORW team sweeps one thana after another in each district. The starting and completion time of the teaching programme as well as the estimated size of households in these districts are given in the following:

District	Starting month	Ending month	Estimated house-holds (1981)
Sylhet	July 1980	June 1983	966,000
Jessore	Nov. 1980	May 1983	633,000
Faridpur	April 1981	June 1983	858,000
Khulna	Oct. 1981	June 1983	741,000
Kushtia	June 1982	June 1983	359,000

The broad objectives of BRAC have been specified in the beginning of this paper. The specific objective of BRAC's oral rehydration programme is to reduce the mortality due to diarrhoea by making available an easily accessible method of treatment and by motivating people particularly mothers to use the method. An evaluation component was included in the programme.

A special study has been designed to evaluate each objective. Here we present details for a mortality surveillance to measure the impact of the oral therapy programme on mortality levels.

STUDY DESIGN

The design for studying the impact of oral rehydration programme on mortality envisages a double stratification of thanas (one geographic and one on the basis of "famine liability"), a sliding selection of two unions from each of four strata. A baseline survey in each union followed by retrospective multi-round surveys in the selected unions have been planned.

STRATIFICATION

A double stratification of the five districts under the programme has been made. The first was a geographic stratification. Sylhet on one side and the four others (viz. Jessore, Faridpur, Khulna and Kushtia) were considered as two different geographic clusters (See Appendix 2). The second stratification was done on the basis of the susceptibility of these areas to food shortage and famine. Famine is an important factor causing variation of death rates. Recent examples of the importance of famine on mortality levels have occurred in Companiganj and Matlab (10,14).

Differences in the effectiveness of the method with respect to the impact on mortality could occur in case some areas experience food shortage and famine and some do not experience any such. This stratification has been done by classifying the Districts into three categories (15).

The scheme lists each thana according to the following categories,

1. Thanas very liable to famine.
2. Thanas liable to famine.
3. Thanas least liable to famine.

If the thanas of the five districts under the programme are categorised according to the above schemes, the picture stands like the following:

Famine liability categories	No. of Thanas	
	Sylhet	Four other districts
1	-	(8)
2	5	(35)
3	(27)	(37)
All Strata 112	32	80

Thus the two way stratification has categorised the 112 thanas of the five districts into five "groups". Only the groups in parentheses would be studied through the evaluation.

THE SAMPLE SIZE

Determination of an "adequate" sample size for a mortality study requires prior knowledge of the age specific pattern of deaths in the population. A measurable impact of the BRAC programme can be expected primarily in the 1-4 age group. In this age range, the death rates has been estimated at 48 per 1,000 population in Companiganj. The death rate due to diarrhoea and malnutrition related causes was 27.8. Let us consider an average union having a population of 20,000 and calculate the expected number of deaths before and after the programme (with an assumed reduction of one third of the death rate).

Total population of union	20,000
Total population in 1-4 age group	3,000
Total diarrhoeal deaths expected including malnutrition deaths (27.8 per thousand per year)	83.4
Total diarrhoeal deaths expected per six months prior to the programme	42
Total diarrhoeal deaths expected per six months after the programme	28

A sample size of about 20,000 would thus seem to be minimal measuring mortality changes. Small affects of the programme on mortality would be difficult to assess. Further, a union has defined boundaries and the villagers know in which union their households fall. Cluster sampling was adopted and compact unions were selected from each of the four group of thanas (stratum).

SELECTION OF UNIONS

In the selection of the two unions in each stratum, a "sliding process" was observed. The second union is separated from the first by about a year of programme time. In Sylhet stratum, two unions, viz. Mirpur in Bahubal thana and Munsurnagar in Rajnagar thana, were selected. The house-to-house teaching programme of *lobon-gur* saline in Mirpur was done in June-July 1981 while the programme in Munsurnagar will be done in June-July 1982. Similar selections were made in other strata as well. This process of selections will allow the observation of changes as the programme is modified over time. This will also deal with changes in vital rates not related to the programme by providing a "comparison" area. This will be possible because retrospective surveys will be done every six months simultaneously in both unions before and after programme implementation. The following scheme for Sylhet stratum is provided to give an indication of the union selection and timing of retrospective multi-round surveys.

Timing of Surveys and Programme in Sylhet stratum	Union 1 (Mirpur)	Union 2 (Munsurnagar)
May 1981	Baseline survey	Baseline survey
June 1981	Programme	
November 1981	Followup survey 1	Followup survey 1
May 1982	Followup survey 2	Followup survey 2
June 1982		Programme
November 1982	Followup survey 3	Followup survey 3
May 1983	Followup survey 4	Followup survey 4
November 1983	Followup survey 5	Followup survey 5

The initial design called for a random selection of a union from amongst the unions covered during a six-monthly period. Since the second union has to be selected with comparable characteristics such as health facilities, urban effect, communications etc., it required a visit to each of the unions. Thanas falling in a six-monthly time period were listed and one was selected at random from the first time period. Thus Bahubal was selected from the Jan-June 1981 time period thanas (i.e. those thanas where the teaching programme was done during this period). The thanas falling in Jan-June 1982 formed the frame for the second thana selection and from that Rajnagar was selected at random. A similar process was followed in the selection of other thanas. The list of selected thanas is

is given below:

Stratum	Thana 1 (District)	Thana 2 (District)
Sylhet	Bahubal (Sylhet)	Rajnagar (Sylhet)
Other I	Godairhat (Faridpur)	Jajira (Faridpur)
Other II	Morrelganj (Khulna)	Shalikha (Jessore)
Other III	Batiaghata (Khulna)	Mirpur (Kushtia)

QUESTIONNAIRE

For the baseline survey, two sets of questionnaires have been developed. A short questionnaire listing household composition, sex and age as well as birth and death events for the last 13 months administered to all households. A more detailed questionnaire, including SES information and more detailed information on children ever born, survivorship and pregnancy status is administered to 20% of the households. Details of the questionnaires used for the baseline and follow-up surveys are to be found in Appendix 6-10.

FIELD OPERATIONS

Brief details of the field operations are provided now. A list of villages in a union as well as a map is first prepared utilizing existing documents and correcting them by field visits. Before interviews can be started in a village three field tasks are undertaken--mapping, listing and numbering. Maps and household lists barely exist for at the village level. Hence the field teams have to prepare them. In this study, all listing starts from the North-West corner of the village and the entire village is listed anti clock-wise. The listing operation is undertaken when the village boundary is identified. A listing form is given in Appendix 3.

One unique feature in this study is the use of number plates for all households in the village. As soon as listing of a household is finished a number plate showing the number assigned to this particular household is fixed at the door of that household or at a suitable place visible from outside and beyond the reach of children. The number in Bengali is painted on a metallic sheet. Though it involves some cost, which is less than one taka per household, it gives some important advantages: Besides being more durable than ordinary census numbering, a number plate has been found to be extremely helpful in locating households which are missed or duplicated during the household listing. Moreover, the supervisors while walking through the village can make random checks without actually visiting every household by asking people on the way whether their households were numbered.

MAPPING

The next operation is making a rough sketch-map of the village. This shows (a) the physical boundary of the village, (b) the households and important landmarks and (c) the physical characteristics such as canals, *khals*, roads, paths, mosques, big ponds, etc. Such a sketch map is very helpful in locating the households of interest. This is particularly useful for the supervisor when he spot-checks and re-interviews. Specimen of such a sketch-map is given in Appendix 5.

INTERVIEW TRAINING

As soon as the listing, numbering and mapping of a village are completed, interviewers' training for the baseline survey starts. The group of persons involved in listing are trained to become interviewers for the baseline survey. As mentioned earlier, baseline survey is divided into two phases. The first phase interviewers are males and they go to each household and collect information on some selected household characteristics, births and deaths. The second phase interviewers are females and they go to every fifth household and collect information on fertility and pregnancies during the intervening period and diarrhoeal morbidity and treatment during the week prior to the survey.

The senior supervisory staff stationed at head office receive in-service training and over time with the development of field methodology. These senior staff, at the initial stage of field work, remain with the team in the field and train the potential team supervisors from the selection of interviewers. They are withdrawn when the lower level field supervisors become capable of managing the team. The training for grass-root workers (vis. listers/interviewers) are organised in the field.

The listers are trained initially for two days and subsequently during the course of listing. The two days training consists of one day in classroom and one day in the field. For each phase of the baseline survey, a three-day training programme is organised. The first two days are spent in classroom discussion about the theoretical aspects, such as sampling, interview techniques, etc. and the practical aspects relating to filling of different questionnaires. The third day is spent in field practice. The problems encountered and experiences gathered during field practice are subsequently discussed amongst the interviewers and their supervisors. The field practice and subsequent discussion is helpful to answer interviewers' questions and develop rapport with their supervisors. The interviewer's manual also serves a useful purpose (2).

DATA COLLECTION AND SUPERVISION OF FIELD WORK

The data collection is started as soon as the training is completed. Initially, they are given less than normal amount of work, assessed by the average number of questionnaires a trained interviewer can complete in a day. The normal load is given when the supervisors become confident about the quality of work of a particular interviewer. If the appropriate level of work and quality is not reached the supervisor recommends termination of the interviewer's contract.

The interviewers go to a village as a team and interview the households individually in one or more days. The day's work is distributed in the morning by the supervisor. The supervisor keeps a record of each assignment for making spot-checks and re-interviews. The sketch map and number plates help him a great deal in locating the households. The interviewers, during their stay in the village, interview the assigned households and make call-backs. The interviewers return to their camp in the late afternoon. During the same evening they recheck the completed questionnaires for completeness. Before submitting the completed questionnaires to the supervisors they complete the interviewer's daily record sheet (2). A major section of the supervisor's work then starts. The scrutinizing of the questionnaires keeps him busy till late in the night. The questionnaires with serious mistakes are corrected in consultation with the concerned interviewers. Once the data collection in a village is completed, they are sent to the head office for processing.

DATA PROCESSING

Once the data are received in the head office, the quite long trek of processing starts. It starts with the registration of the questionnaires. Details of data processing are outside the purview of this paper. The purchase of a micro-processor is planned, so that most of the work can be done internally in BRAC.

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APPENDIX 1

TEN POINTS TO REMEMBER

1. Diarrhoea is the condition of a patient who has more than one watery stool in a day.

2. Transmission of diarrhoea is by the anal-oral route. This means the faeces of an infected person or a carrier enters someone else's mouth.

3. Treatment of diarrhoea is oral replacement mixture, fluid and food.

4. Oral Replacement Mixture is a mixture of sugar and salt in water. *Lobon-gur* mixture is one kind of oral replacement mixture.

5. *Lobon-gur* Mixture is made by mixing a three-finger pinch of salt (up to the first crease of the index finger) to a four-finger scoop of gur in one-half *seer* of tubewell or Boiled water and stirring.

6. You should Begin giving *Lobon-gur* mixture after the first watery stool.

7. For children, the amount of *Lobon-gur* mixture should equal the amount of water in the stools. If the mother does not know, let the child have as much as he desires.

   For Adults, give one-half seer for each stool.

8. *Lobon-gur* mixture can be Dangerous when:

   1. Too much salt is added to the mixture.
   2. Infants and small children are not given small, frequent feedings

9. A Doctor should be consulted when:

   1. Diarrhoea lasts for more than two days
   2. The patient cannot take fluid by mouth
   3. The patient has severe diarrhoea and cannot replace the water he loses in his stools with *lobon-gur* mixture

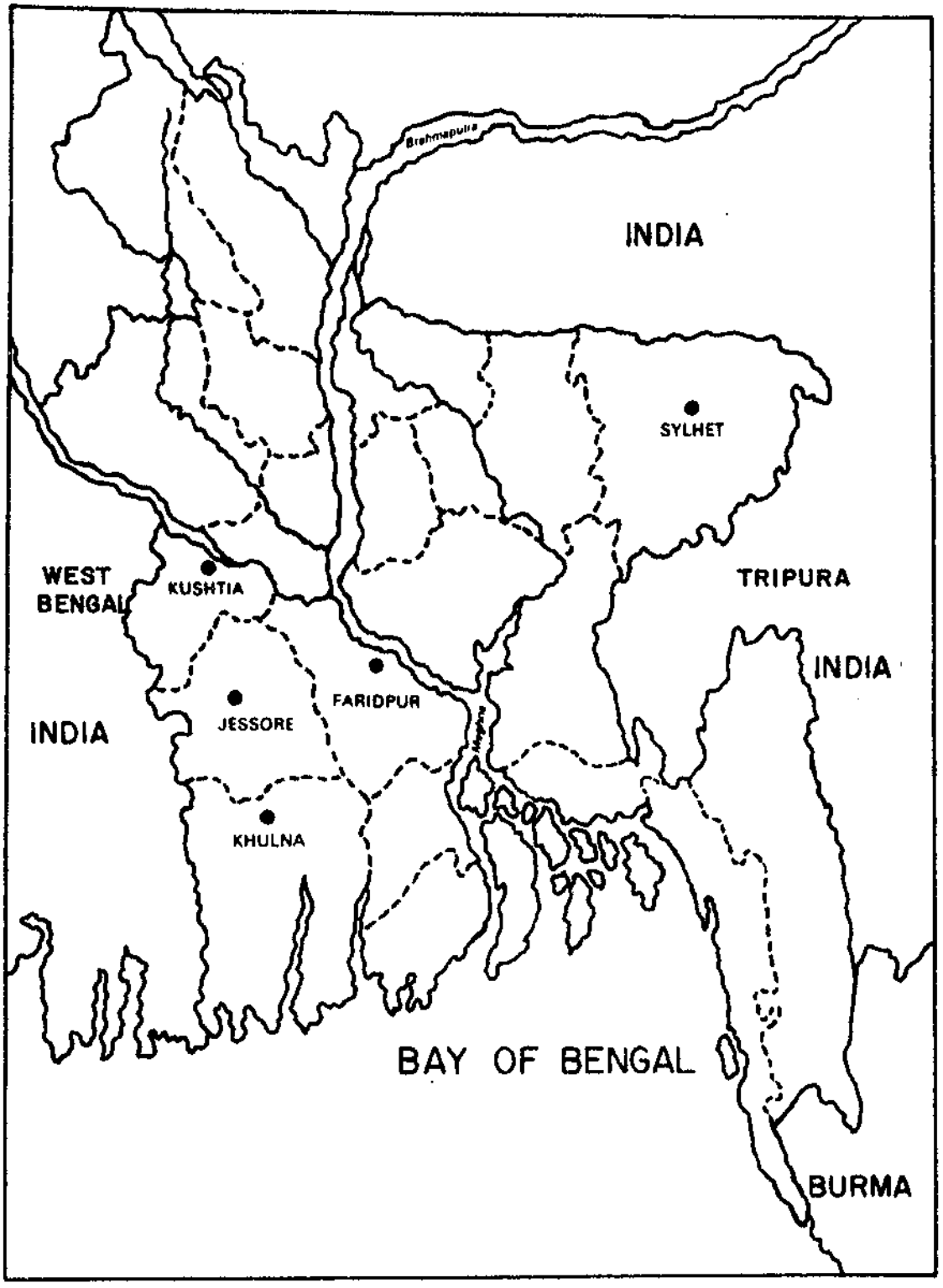
10. Nutritional Advice for patients with diarrhoea includes:

    1. During diarrhoea he should continue to take food and fluid.
    2. After diarrhoea he should take more than normal amount of food for seven days.

APPENDIX 2

BANGLADESH

DISTRICTS TO BE COVERED BY ORAL THERAPY EXTENSION PROGRAMME DURING JULY, '80 - JUNE, '83



APPENDIX 3

E V A B O

Household Listing Schedule

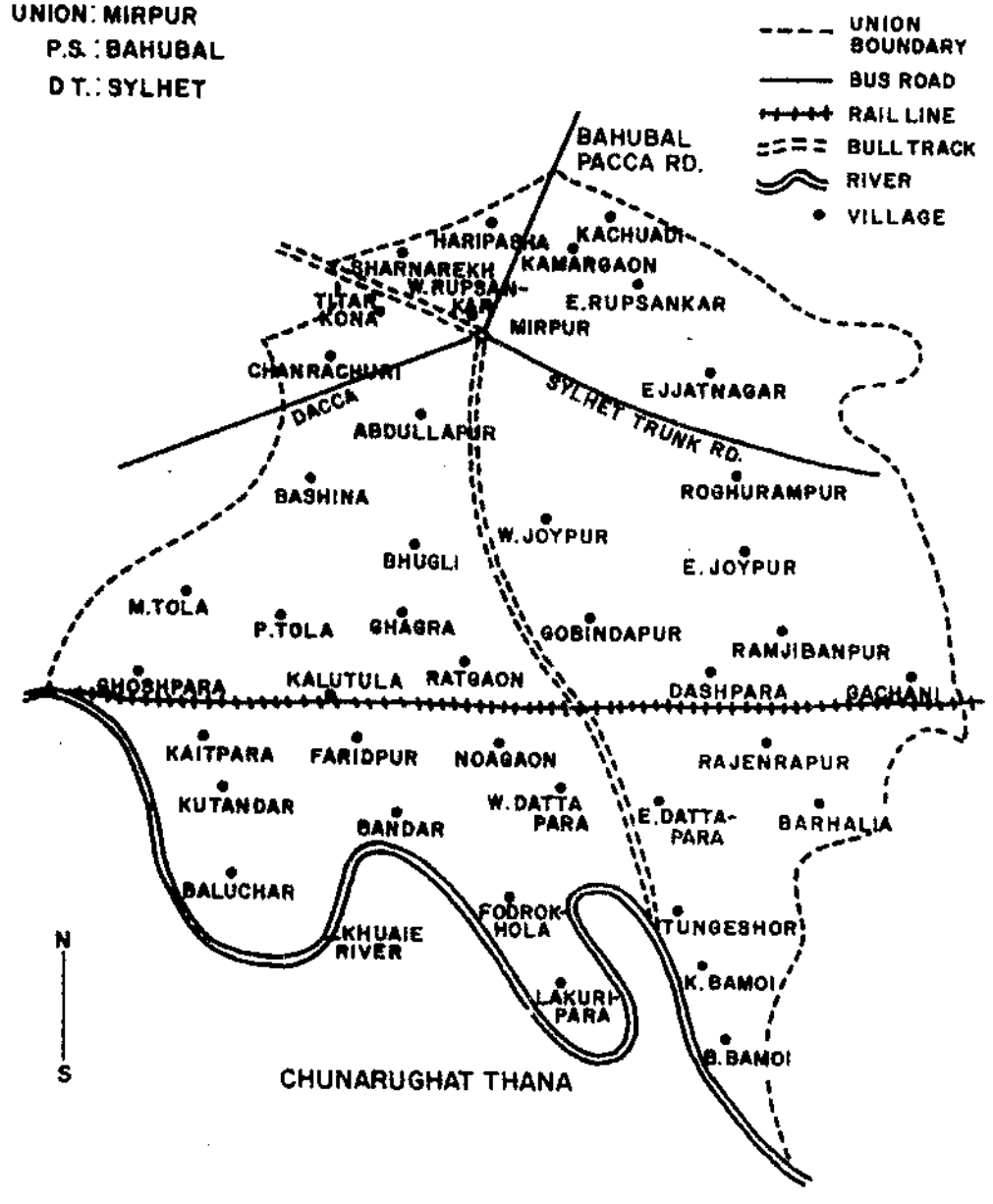
THANA _____ UNION _____ VILLAGE _____

Interviewer _____ Date _____

Sl.No.	Name of Head of Household	Father's/Husband's Name of HHH	Address/ Location

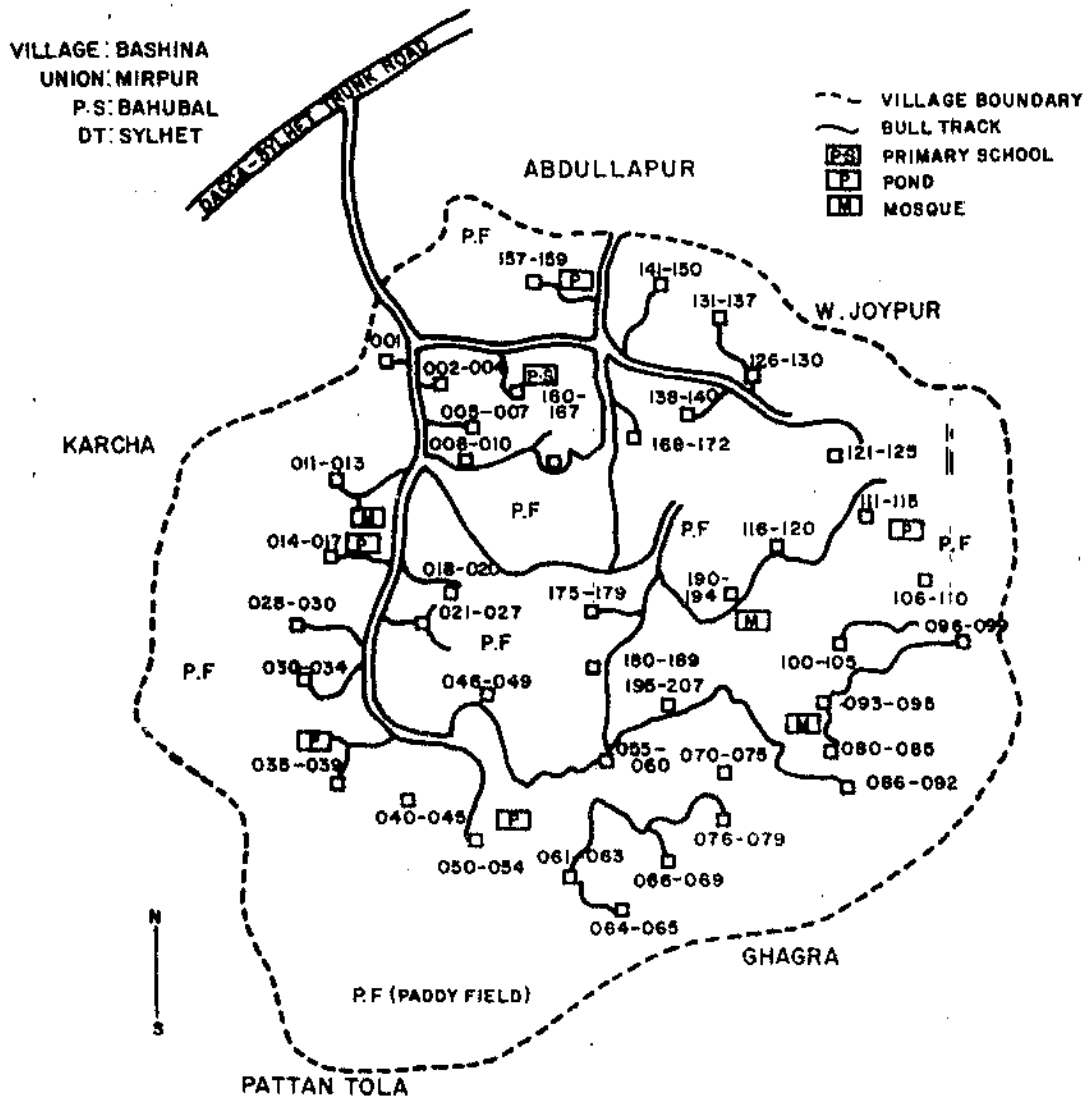
APPENDIX - 4

SPECIMEN SKETCH-MAP OF A UNION



APPENDIX – 5

SPECIMEN SKETCH-MAP OF A VILLAGE



APPENDIX 6

Evaluation of BRAC's Oral Therapy Extension Programme (EVABO)

Form BS1 : Baseline Survey (Part A: Household Composition)

For Research only
Confidential

Thana _____ Household No. ____

Union _____ Village _____

Name of head of household _____ Religion _____

Now we would like to know some information about the people who ordinarily live in your household, and any guest/visitors who stayed with you last night

LINE NO.	NAME OF H.H. MEMBERS AND OTHERS	RELATION-SHIP	RESIDENCE		SEX	AGE		If date of birth not known estimate age in complete years.
	Please name the persons who usually live in your H.H. Please name any guest visitors who slept last night in your household. Indicate any other name by which they are known		Does he/she usually live here? Yes/No	Did sleep here last night? Yes/No	Is this person male or female? M/F	When was he/she born? Give month & yr. of birth		
						Yr	Month	
1	2	3	4	5	6	7	8	9
01								
02								
03								
04								
05								
06								
07								
08								

15 Use another sheet for the remaining members

If continuation sheet used, tick here ☐	Just to make sure I have completed listing	1) Are there any other persons such as small children or infants that we have not listed?	Yes ☐	Enter each No. ☐ in table
		2) In addition are there any other people who may not be members of your family, such as domestic servants, friends or lodgers who usually live here?	Yes ☐	Enter each No ☐ in table
		3) Do you have any guests/ visitors or any other person who stayed last night with you?	Yes ☐	Enter each No ☐ in table

Interviewer: Please complete form BS1 Part B and C.

APPENDIX 7

Evaluation of BRAC's Oral Therapy Extension Programme (EVABO)

Form BS1 Baseline Survey (Part B: Birth Recording)

For Research only Confidential									

Thana_____ Household No. | | | | |

Union_____ Village_____

Name of head of household_____ Religion_____

Interviewer: From the last _____ till now, that is, during the last 13 months, please complete this form for each birth that occurred to the members of H.H. and these occurred in the H.H. but may not be to a regular member. Ask.
(Bengali month)

"From last _____ to now, that is, during the last 13 months, was there any birth occurred in this household to any regular member or to a guest, or was there any birth occurred elsewhere to the members of this household. Pl. tell about those".
(Bengali month)

One or more birth ☐

No birth ☐

Still birth ☐ live birth ☐

Ask again about birth. If 'No birth' complete BS1: Part C

For each live birth occurred complete the following form

Information on Child:

1. Date of birth:
2. Name of child:
3. Sex of child:
4. Is the child alive now?
5. Place of birth

Information on Parents:

1. Father's name:
2. Occupation of Father:
3. Name of mother :
4. Age of mother :
5. Birth order :
6. Is the mother a regular member of this household?

Interviewer: Please make sure by asking again that there was no other birth than that recorded above. If any other birth, record it in another form BS1: Part B and staple with this. If no other birth, complete form BS1: Part C.

APPENDIX 8

Evaluation of BRAC's Oral Therapy Extension Programme (EVABO)

Form BS1: Baseline Survey (Part C: Death Recording)

For Research only
Strictly Confidential

Thana _____ Household No. [ ][ ]:[ ][ ]

Union _____ Village _____

Name of head of household _____ Religion _____

Interviewer: From the last _____ till now, that is, during the last
(Bengali month)
13 months, please complete this form for each death occurred to the members of H.H. and those occurred in this H.H. but may not be to a regular member. Ask - From the last _____ till now, that is, during the last 13 months, was there
(Bengali Month)
any death occurred in this H.H. to any regular member including infants and children or to a guest or was there any death occurred elsewhere to the members including infants and children of this household. Please tell me about those.

One or more death [ ]

For each death occurred complete the following:-

No death [ ]

Ask again about deaths and if "no death", staple the forms completed for this household and move to another.

Information

1. Date of death:
2. Name of deceased:
3. Father's Name:
4. If married women, husbands' name:
5. Relation to Head of H.H.:
6. Sex:
7. Age at death:
   (Yr./month/day, for children and infants)
8. Marital status:
9. Occupation:
10. Whether a regular member of households:
11. Place of death:

12. Events and symptoms leading to death:

Measles	/__/	Acute Diarrhoea	/__/
Tetanus	/__/	Chronic "	/__/
Drowning	/__/	Acute Dysentery	/__/
Murder	/__/	Chronic "	/__/
Suicide	/__/	Child birth	/__/
Pneumonia	/__/	Jaundice	/__/

Others (specify) _____

Interviewer: Please make sure by asking again that there was no other death than that recorded above. If any other death, record it in another form BS1 Part C. If no other death, staple all forms completed for this H.H. and move to another.

APPENDIX 9 (Continuation of BS1 Part-A for 20% households)

Evaluation of BRAC's Oral Therapy Extension Programme (EVABO)

Form BS2: Baseline Survey (Part A: Household Composition)

For Research only
Strictly Confidential

Household No. [ ][ ][ ][ ]

Thana _____

Union _____ Village _____

Name of Head of H.H. _____ Religion _____

Now I want to know some informations about the members of your household

LINE NO. (as in BS1 Part A)	EDUCATION		MARITAL STATUS FOR THOSE AGED 8 YEARS & OVER		Only for currently married women	Is he/she involved in gainful work? Yes/No	OCCUPATION	Tick for Currently married women aged <50
	Can he read & Write a Letter? Yes/No	If "Yes" What was the highest class read?	Has he/she ever been married or engaged? Yes/No	If yes Is he/she now married/ widowed/ divorced or separated?	Where her husband normally resides?			
	10	11	12	13	14	15	16	17
13	Use another sheet for the remaining members.							

APPENDIX 10

Evaluation of BRAC's Oral Therapy Extension Programme (EVABO)

Form BS2:Baseline Survey (Part B: Pregnancy & Termination)

For Research only
Strictly Confidential

Household No. ____

Thana _____

Union _____ Village _____

Name of Head of Household _____

Interviewer: Complete this form only for the women ticked in column 17 about some member of this household

LINE NO. from (BS2 Part A)	Name of women ticked in col. 17 of Form BS2: Part A.	No. of children ever born alive					Information
		How many of the own children are living with her		How many of the own children are living elsewhere		How many of the own children (born alive) are now dead	From the last (Bengali month) till now, that is during the last 13 months was there any child born to her
		Son	Daughter	Son	Daughter	Total	
1	2	3	4	5	6	7	8

Interviewer: Please ask whether there are any other women in the household who are currently pregnant. If yes, write her name above and complete the form accordingly.

Interviewer's Name _____ Scrutinized / / _____

Date _____ Spot checked / / _____

of form BS2 Part A and ask - now I will ask some questions

On births last 13 months			Current Pregnancy Status	
If yes, When (Date)	Where is he/ she now? alive/dead	If alive ask name (check with HH list)	Is she pregnant now? Yes/No	If yes, when the delivery is expected? (month)

Re-interviewed /___/ _____

Edited /___/ _____

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