

UNITED STATES OF AMERICA  
AGENCY FOR INTERNATIONAL DEVELOPMENT 58886  
Dacca, Bangladesh

PD-AAA-604

Dr. Susan T. Pettiss  
Director of Blindness Prevention  
Helen Keller International, Inc.  
22 West 17 St.  
New York, New York 10011

March 30, 1982

Subject: Grant No. 388-0050-G-00-2002-00  
Appropriation: 72-1121021.4  
BPC:HDA-87-27388-BG-13

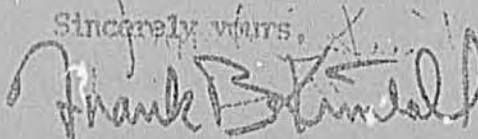
Dear Dr. Pettiss:

Pursuant to the authority contained in the Foreign Assistance Act of 1961, as amended, the Agency for International Development (hereinafter referred to as "AID" or "Grantor") hereby grants to Helen Keller International, Incorporated (hereinafter referred to as "HKI" or "Grantee") the sum of One Hundred Thousand United States Dollars (\$100,000) to provide support for a Xerophthalmia Prevalence Survey as more fully described in the annex to this Grant entitled "Xerophthalmia Prevalence Survey Protocol." This Grant is effective and obligation is made as of the date of this letter and shall apply to commitments made by the Grantee in furtherance of program objectives during the period through September 30, 1983.

This Grant is made to HKI, on condition that the funds will be administered in accordance with the terms and conditions as set forth in Annex A entitled "Xerophthalmia Prevalence Survey Protocol," and Annex B entitled "Standard Provisions and Statement of Assurance of Compliance" which have been agreed to by your organization.

Please sign the Statement of Assurance of Compliance, enclosed herein, and the original and seven (7) copies of this letter to acknowledge your acceptance of the conditions under which these funds have been granted. Please return the Statement of Assurance of Compliance and the original and six (6) copies of this Grant to AID/Dacca.

Sincerely yours,



Frank D. Kimball  
Director

## Attachments:

- Annex A Xerophthalmia Prevalence Survey Protocol  
Annex B Standard Provisions and Statement of Assurance of Compliance  
Annex C RDC Letter to HKI - Approval of Protocol

## ACCEPTED:

Helen Keller International, Incorporated

By: Susan S. Pettiss  
Dr. Susan T. Pettiss

Title: Director of Blindness Prevention

FISCAL DATA

Appropriation: 72-3321021.4

BPC:HIAA-87-27388-BG-13

Project No. 388-0050-G-00-2002-00

Total Grant Amount: \$100,000



HELEN KELLER  
INTERNATIONAL  
INCORPORATED

(formerly  
American  
Foundation  
for Overseas  
Blind Inc.)

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ANNEX A:

XEROPHTHALMIA PREVALENCE SURVEY

PROTOCOL

BANGLADESH, 1981 - 1982

Nicholas Cohen  
Carol Measham  
James Sprague

July 1981

ANNEX B: STANDARD PROVISIONS

ASSURANCE OF COMPLIANCE WITH THE AGENCY FOR  
INTERNATIONAL DEVELOPMENT REGULATION UNDER TITLE VI  
OF THE CIVIL RIGHTS ACT OF 1964

Helen Keller International, Inc. (hereinafter called the "Grantee")

HEREBY AGREES THAT it will comply with the title VI of the Civil Rights Act of 1964 (P.L. 88-352) and all requirements imposed by or pursuant to the Regulation of the Agency for International Development (22 CFR Part 209, 30 FR 317) issued pursuant to that title, to the end that, in accordance with title VI of that Act and the Regulation, no person in the United States shall, on the ground of race, color, religion, sex or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under and program or activity for which the Grantee receives Federal financial assistance from the Agency; and HEREBY GIVES ASSURANCE THAT it will immediately take any measures necessary to effectuate this agreement.

If any real property or structure thereon is provided or improved with the aid of Federal financial assistance extended to the Grantee by the Agency this assurance shall obligate the Grantee, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which the Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits. If any personal property is so provided, this assurance shall obligate the Grantee for the period during which it retains ownership or possession of the property. In all other cases, this assurance shall obligate the Grantee for the period during which the Federal financial assistance is extended to it by the Agency.

THIS ASSURANCE is given in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property, discounts or other Federal financial assistance extended after the date hereof to the Grantee by the Agency, including installment payments after such date on account of applications for Federal financial assistance which were approved before such date. The Grantee recognizes and agrees that such Federal financial assistance will be extended in reliance on the representations and agreements made in this assurance, and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Grantee, its successors, transferees, and assignees, and the person or persons whose signatures appear below are authorized to sign this assurance on behalf of the Grantee.

Helen Keller International, Inc.  
(Grantee)

BY (Signature) Susan T. Pettiss

TYPED NAME Susan T. Pettiss

TITLE Director of International Programs

DATE Feb. 18, 1982

## Table of Contents

|                      | page |
|----------------------|------|
| I. Purpose of Survey | 1    |
| II. Introduction     | 1    |
| III. Proposal        | 7    |
| IV. Methodology      | 9    |
| References           | 21   |
| Appendix I           |      |
| Appendix II          |      |
| Appendix III         |      |
| Form #1              |      |
| Form #2              |      |
| Form #3              |      |
| Form #4              |      |

XEROPHTHALMIA PREVALENCE SURVEY  
PROTOCOL

PURPOSE OF SURVEY

The major objective of the survey is to determine the prevalence of xerophthalmia among children from birth to six years of age in Bangladesh. Secondary objectives are to determine the percentage of the target population receiving and not receiving vitamin A capsules under the existing distribution program; identify characteristics of populations receiving and not receiving such capsules; define risk factors associated with xerophthalmia; and determine the association between serum vitamin A levels and reported night blindness.

II. INTRODUCTION

A. Background

Vitamin A deficiency and blinding xerophthalmia have been well documented in Bangladesh for many years by nutritional and clinical studies. However, the public health significance of xerophthalmia in terms of size of problem and distribution throughout the country has not been determined. After the War of Independence in December 1971, many children with corneal destruction were seen in hospitals and health centers throughout the country. A WHO consultant documented widespread xerophthalmia after the war, and in 1973-74, approximately 15,000 children 0-6 years of age were examined in seven areas around the country.<sup>1</sup> Approximately 1% of these children complained of night blindness, and widespread conjunctival xerosis was noted. Although this study was generally considered a national survey, it was not well standardized or randomized. Consequently, the data generated do not serve as a baseline indication of xerophthalmia in Bangladesh. However, the results were in agreement with other observations suggesting the public health significance of

xerophthalmia.<sup>2,3</sup> An effort to reduce this disease by distribution of large dose (200,000 IU) vitamin A capsules (VAC) was initiated by the Government in 1973 on a national scale.

The operational goal of the capsule distribution program was to administer a vitamin A capsule twice a year to each child under the age of six years. The initial target population was estimated at 15.4 million, and the capsules were distributed through the administrative infrastructure of the malaria eradication program. In 1974, field activities in health, family planning, and malaria eradication were integrated and the field workers of the combined service became known as family welfare workers (FWW), with about fifty percent of this new category formed by the malaria workers. In 1975, the family planning workers were again separated from those in the health division, and the distribution of the vitamin A capsules remained solely within the jurisdiction of the health division. In 1980, the workers were again integrated from the thana level down, with both categories being responsible for distribution of vitamin A capsules since March 1981.

#### B. Blindness Prevention Program, Bangladesh

The Blindness Prevention Program, Bangladesh (BPPB) was formed in 1973 to be responsible for the development and implementation of blindness prevention strategies, with primary focus on the distribution of vitamin A capsules. As a special project of the Ministry of Health, it has received funds directly from UNICEF, which has also undertaken the capsule procurement. In 1980, an Evaluation Committee was set up by the Government of Bangladesh (GOB) to consider the effectiveness of the project and determine the need for further intervention.

The staff of the BPPB currently consists of a part-time "additional director", two junior physicians and four office personnel. The physicians

7'

are Ministry of Health employees, while the others are paid out of project funds. At the request of UNICEF and the GOB, Helen Keller International (HKI) has been offering assistance to the program since 1978 with special attention to program development and ongoing statistical evaluation. A full-time HKI field representative is based in Dacca; part-time consultation is offered through visits by an American public health physician and HKI headquarters staff.

The BPPB program related to xerophthalmia presently includes:

- periodic mass distribution of high dose vitamin A capsules to preschool children, and night blind children ages 7-15 years;
- nutrition education, assisted by flip books, posters, films, and slidesets;
- supply of vitamin A capsules and injectable vitamin A to hospitals and health centers for treatment of acute xerophthalmia;
- training of health, medical and nutrition personnel in the detection, treatment and prevention of xerophthalmia;
- provision of capsules to new mothers immediately post partum through the network of traditional birth attendants."

#### C. Evaluation of the Blindness Prevention Program

Since its beginning in 1973, there have been several efforts to evaluate the impact and the success of the blindness prevention program.<sup>4,5,6,7</sup> These

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\*The protocol was revised in 1980 at the WHO Jakarta meeting, whereby it was recommended that lactating mothers not be part of a target group of distribution.

9'

evaluations have been primarily part of the ongoing program protocol, with one undertaken by an outside agency, and another assisted by UNICEF field personnel. In addition, WHO has attempted periodic assessment through a review and analysis of BPPB reports and information.

These evaluation efforts were reviewed in April 1980 by the HKI consultant, Dr. Rob Northrup, and field representative, Carol Measham. Table I details characteristics of the various studies undertaken since 1973.

TABLE I  
BPPB EVALUATION STUDIES: CHARACTERISTICS

| <u>OBSERVERS</u>                          | <u>1973-74</u><br><u>Surveys</u>            | <u>Clinical Field</u><br><u>Evaluation</u> | <u>FWW</u><br><u>Reports</u>         | <u>UDR</u><br><u>SURVEY</u>                 | <u>District Team (3)</u><br><u>Assessment</u> | <u>BPPB Impact</u><br><u>Survey</u>   |
|---|---|--|--------------------------------------|---|---|---|
| <u>Type</u>                               | Physicians                                  | Physicians                                 | FWWs ,GHAs                           | UNICEF<br>National<br>Adminis-<br>trators   | District (4)<br>Level Staff                   | HIs ,AHIs   |
| Number                                    | 3   | 2  | 12,000                               | 14  | 200+  | 179   |
| Training                                  | by WHO<br>consultant                        | Reading,watching<br>(informal)             | Thana meeting<br>Manual              | Written<br>Instructions                     | Workshops,<br>Written<br>Instructions         | by BBPP<br>Doctors  |
| Supervision                               |   |  | ?<br>(routine)                       | none  | none  | none  |
| <u>SAMPLE SIZE</u><br><u>Children 0-6</u> | 20,000                                      | 2600                                       | (1)<br>17,000,000                    | 6000  | 14,411  | 10,836  |
| FWW Areas                                 | 7   | 5  | 12,000 (1)                           | 140   | 349   | 179   |
| Thanas                                    | 7   | 5  | 420 (1)                              | 70  | 349   | 117   |
| Districts                                 | 7   | 5  | 19 (2)                               | 14  | 17  | 18  |
| <u>ITEMS SURVEYED</u>                     | Complete eye<br>exam,all xero-<br>phthalmia | All xerophthalmia                          | Nightblind,<br>Vita caps<br>coverage | Nightblind,<br>Vita caps<br>coverage        | Nightblind,Vita caps<br>coverage              | Nightblind,<br>Bitot spots<br>(X <sub>1B</sub> )                                      |
| <u>SPECIAL CHARACTERISTICS</u>            |   | Same areas as<br>1973-74 surveys           | Routine<br>activity<br>reports       |   | Team chosen for ex-<br>perience,reliability   | Surveyors<br>chosen for<br>experience,<br>reliability<br>100% capsule<br>distribution |
| <u>WHEN PERFORMED</u>                     | 1973-74                                     | Jan-Mar,1979                               | After each<br>distribution           | After 9th dis-<br>tribution<br>Apr-Jul,1979 | After 10th capsule<br>distribution            | Baseline<br>Jan-Feb 1980<br>Subsequent-<br>ly every 3<br>mos                          |

- (1) Potential - actual reports from less than this
- (2) Two districts failed to report
- (3) Data from assessment after 10th round, five districts assessed after 9th round
- (4) Approximately 10 per district team

10

However, it was pointed out that the clinical field evaluations suffered from a number of difficulties: their national scope had been questioned; the examiners differed greatly in their training; the examiners looked for different criteria in the surveys, with the subsequent data not specifically comparable; and the studies suffered from poor standardization during the field work itself.

Even so, the above reports have been useful in gathering information for program supervision and operations. For example, the following Table II demonstrates the current relationship suggested between VAC coverage and prevalence of reported night blindness.<sup>8</sup>

TABLE II  
PREVALENCE OF NIGHT BLINDNESS BY PERCENTAGE COVERAGE ACHIEVED

|                        | PERCENT COVERAGE |        |        |        |         |        |
|------------------------|------------------|--------|--------|--------|---------|--------|
|                        | 0-25%            | 26-50% | 51-75% | 76-94% | 95-100% | Total  |
| # of Children in areas | 3562             | 1383   | 2049   | 4124   | 2589    | 13,707 |
| # of Cases of XN       | 73               | 21     | 21     | 41     | 10      | 166    |
| Rate of XN             | 2.05%            | 1.52%  | 1.02%  | 0.99%  | 0.39%   | 1.21%  |

$$\chi^2 = 38.5 \quad df = 4 \quad p = \leq 0.001$$

NOTE

Because of the continuous distribution of capsules, it is not known how high the prevalence would be with no VAC distribution

In addition, another report includes a map on areas of high prevalence of reported night blindness, based on district reports (See Appendix I).

However, given the extent of the program, the GOB has directed the Planning Cell of the Ministry of Health (Health Division) to form a Committee to prepare a protocol for studying further the vitamin A capsule distribution program. The Committee has accepted the technical assistance of HKI in developing such a protocol.

#### D. Further Need for Evaluation

As mentioned, the previous studies have been limited in scope, and have concentrated on evaluating the percentage of coverage of the target population. There are additional areas which should be considered: 1) risk factors associated with xerophthalmia; 2) relation of reported night blindness to other indicators of xerophthalmia; 3) regional differences in xerophthalmia rates; 4) analysis of individual data on patients suffering from xerophthalmia; 5) characterization of the population receiving and not receiving vitamin A capsules; and 6) certain information on behavior feeding patterns of the families of xerophthalmic and nonxerophthalmic children.

### III. PROPOSAL

The primary objective of the proposed study is to determine the prevalence of xerophthalmia among children from birth to six years of age in Bangladesh. Secondary objectives are to determine percentage of target population receiving and not receiving such capsules; define risk factors associated with xerophthalmia; and determine association between serum vitamin A levels and reported night blindness.

Specifically, it is recommended that the proposed survey collect data in the following areas:

- 1) National point prevalence figures for xerophthalmia and blindness in children 0-6 years in rural areas. The sample will be large enough to

detect regional differences in prevalence rates.

- 2) Urban sample sites, to be deliberately chosen to reflect slum areas. Since no denominator data is available, these figures will not demonstrate statistically significant differences, but will provide some indicator of the problem.
- 3) Percent coverage of the target population by the current vitamin A distribution program.
- 4) Definition of the population receiving and not receiving vitamin A capsules at this time, including questions on accessibility to health care services, nutritional status, and socioeconomic status.
- 5) Definition of risk factors thought to predispose to xerophthalmia, including questions on concurrent illness and feeding practices.
- 6) Serum vitamin A levels in children with reported night blindness.
- 7) Information on behavior feeding patterns in terms of vitamin A and xerophthalmia

Survey results are seen as useful in supplying the program with data on:

--epidemiological definition of the prevalence of xerophthalmia, allowing regional differences to be known to assist in determining targeting possibilities in regions of high prevalence;

--program coverage of the existing BPPB activities

--definition of the relationship of nutritional status to xerophthalmia, important in determining intervention strategies and improve referral mechanisms;

--vitamin A serum levels and nightblindness, to confirm the suggested reliability of reported night blindness and vitamin A levels, currently used as a field indicator of the disease in Bangladesh;

--any indication of xerophthalmia in urban slum areas, to assist in program developments; and

--feeding habits of children, to improve messages and media campaigns in nutrition education and vitamin A.

Hence, such a survey will allow for program planning, and priority considerations within the BPPB.

#### IV. METHODOLOGY

##### A. Sample Selection

A number of previous sample surveys have been conducted in Bangladesh; however, the sample frame designed for the 1981 Contraceptive Prevalence Survey (CPS) has particular advantages for the xerophthalmia study. It is a multi-stage, stratified cluster sample in which sample sites were selected with a probability proportional to size as indicated by the 1974 census. The CPS is to be undertaken in the spring of 1981; hence current demographic data and knowledge of site locations will be known. The CPS field workers and thana health authorities in the areas in which the sample has been chosen will not know that further studies are planned for the same area.

The CPS sample uses 120 rural sites which were developed from previous contraceptive and fertility surveys done in 1977 and 1979. (See map, Appendix II). Full mapping and population enumeration will be carried out, with subsequent data available in the summer of 1981. The Management Information Services Unit of the Family Planning Division of the Ministry of Health conducting this survey is agreeable to its sample frame being used by the xerophthalmia prevalence survey.

Urban sampling has been difficult because of poor demographic data. However, the urban poor were the subject of a study by the Center of Urban Studies at the University of Dacca in 1978. The samples were biased toward low socioeconomic groups. This sample frame and the accompanying demographic data can be used for urban xerophthalmia survey work. Approximately ten sites will be used in Dacca, Chittagong, Khulna and Rajshahi.

#### B. Survey Population

Two hundred children under the age of six years will be examined at each sample site for a total rural sample population of 24,000. This sample size should provide prevalence figures on xerophthalmia and blindness related to xerophthalmia, which will be statistically significant at the regional level. All children under six years will be examined by an ophthalmologist. Any child with ophthalmic manifestations of xerophthalmia, or ocular findings compatible with healed xerophthalmia, will have a clinical form filled out. Xerophthalmic children, together with age-and sex-matched controls for each, as well as 10% of children randomly selected in each village will be the subjects for a questionnaire to evaluate risk factors associated with xerophthalmia, and for anthropometric measurements (i.e., weight/height information.)

#### C. Survey Forms

Four forms will be used in this survey. A family form will be used to record basic demographic data about each family interviewed. It will include summary information about the ophthalmic findings of each child examined. The second form, concerning the clinical eye examination, will be completed on each child with xerophthalmia and corneal lesions, on his age-sex matched control, and on a 10% sample population under the age of six years.

This questionnaire will include questions on:

- 1) when the FWW last visited the house;
- 2) if--and when--vitamin A capsules were given to eligible children;
- 3) reason vitamin A was not given to child, if applicable;
- 4) if the family has any idea of the purpose of the vitamin A capsule, familiarity with flip book, etc.;
- 5) nutritional feeding practices of the family, including breast-feeding data;
- 6) concurrent illnesses of the children;
- 7) nutritional status data; and
- 8) finally, the socio-economic status of the families will be determined.

The fourth form is a summary sheet, to be completed at each sample site. It will encourage review of the forms in the field, and allow preliminary data analysis.

#### D. Survey Personnel

The survey will be conducted with four field teams supervised by a project director and at least one consultant ophthalmologist. Each field team will consist of a team leader, an ophthalmologist, six enumerators, and two drivers. Because the field work will be done in remote areas with only intermittent central supervision, the day-to-day direction of the team will be done by the team leader. For this reason, it is important that this person have previous experience in epidemiological field work. Persons with this background are available in Bangladesh, many working in government service, such as within the Institute of Epidemiology, the National Institute of Preventive and Social Medicine, as well as in the field. The enumerators should also have had previous survey experience: for example, with the former malaria or smallpox

eradication programs, or with the 1981 contraceptive prevalence survey.

Each team will include an ophthalmologist. The ophthalmologist is necessary to insure the highest quality observation of children with xerophthalmia lesions, particularly those lesions which may be part of the differential diagnosis of xerophthalmia. The ophthalmologist will be responsible for examining the eyes of each available child under the age of six years. He will oversee the height and weight measurements on xerophthalmic children, their controls, and 10% random sample.

Since local ophthalmologists have not been previously used for field work in Bangladesh, there are none with epidemiologic experience. Therefore, the team leader will be in charge of the general field direction of the survey team and their activities. Ophthalmologists at the registrar level in government service will be assigned to this survey. It is proposed that one ophthalmologist from each of the eight medical schools be assigned to the survey.

All eight would be given the same training, but only four will be in service in the field at any given time. It is anticipated that one set of four would work the first half of the survey; the second four would work the second half. This may require modification depending on the demands of the teaching services of the hospitals, If there are two sets of ophthalmologists, the team leader will provide continuity of leadership during the duration of the survey.

#### E. Training

All members of the field team, including the ophthalmologists, will be trained in the rationale and use of the various survey instruments, and recording of findings using the survey forms. The entire team will also

review vitamin A metabolism and the ocular lesions of xerophthalmia. The ophthalmologist will be trained specifically in the detection of xerophthalmia lesions and the differential diagnosis of corneal scarring.

It is proposed that classroom training be conducted within the facilities of the Institute of Public Health and Nutrition, coordinated with the Institute of Nutrition and Food Sciences at the University of Dacca. Clinical training is proposed at the Save the Children's Nutrition Unit (CNU) Islamia Eye Hospital, the Institute of Ophthalmology, and the ICDDRB hospital.

F. Standardization

Since each team will be working in a different region within the country, and there is a possibility of two sets of ophthalmologists, the teams will require careful standardization in the use of the demographic and clinical examination forms. Therefore, the field staff and all the ophthalmologists will complete a two-week training program prior to the start of the survey, and will undertake a one-week pilot study using urban sample sites in Dacca city for practice. A rural trial will be undertaken about the same time.

The entire survey group will be brought together at monthly intervals for quality control of the survey techniques in terms of ophthalmic observations, anthropometry, sampling procedures, general methodology and recording of findings, observer reliability and repeatability. Each of these three re-standardization exercises will allow the urban sampling to be done efficiently, will give the teams a respite from the rural field work, and assist in survey supervision.

G. Field Protocol

The survey will start at the district headquarters closest to Dacca, in

each of the four regions. This is to allow easy communication with the project director in the beginning of the survey. The team leader will advise district and involved thana officials of the presence of his team and his plans. District officials will have been previously advised of the goals of the survey by circular from the Ministry of Health. Each Integrated Thana Health Complex administrator will have been similarly advised by the director of the ITHC program in Dacca, if his thana is involved. These letters will be sent shortly before the beginning of the survey field work.

Village sites that are within easy range of major towns can be visited from the town. If the site is distant from a divisional or sub-divisional center, then the team may be able to work from the Integrated Thana Health Complex, or thana administrative headquarters. The budget includes per diem based on UNICEF rates for a thana level official to accompany a team to the village if the team leader thinks this would be helpful. The official could be useful in contacting the village leader, locating sample sites, identifying local referral mechanisms for xerophthalmic children, etc. The assistance of the family welfare workers responsible for that area is also recommended, both to assist in logistics and allow for their continuing education.

When the village is identified and the team has been introduced to the village leaders, house-to-house visits will arbitrarily begin at the first para (para=neighborhood) encountered when the team entered the village. A household is defined as those sharing a cooking facility. The head of the household or another responsible adult will be interviewed. If no adult is present, the children under six years will be examined, but the history questions will not be asked.

Each child with eye signs compatible with xerophthalmia, an age-sex matched

control, and 10% of the children without positive eye findings will be further evaluated. Height/weight measurements and nutritional/medical history will be obtained for all children in these groups, using form #3. Length will be measured on children under the age of two years. Children with eye signs compatible with xerophthalmia will have the examination findings reported on form #2; eyes with corneal scarring or Bitot's spots will be photographed, using an Eastman Kodak Instatech camera. Each clinical photo will be preceded by a macro photo of card with sample site, family number, patient number and family name.

At the conclusion of work at a sample site, the team leader will complete a summary sheet (form #4) indicating the number of individuals listed, the number of children listed, the number of children examined, and the number of ocular lesions. He will also make a diary entry indicating the site visited, easiest route to the site, travel time required, transport used, and the mileage of the vehicle.

#### H. Equipment Requirements

##### 1. Vehicles

Each team will require two vehicles. They will transport the team, survey equipment, and their overnight gear. A vehicle is also required for the project director to monitor field activities, and serve as a standby vehicle in case of breakdown. The Vitamin A Evaluation Committee of the Ministry of Health will request that vehicles assigned to other projects or vehicles that are being brought into the country at this time, be made available to the team for the duration of the survey work.

##### 2. Office Space

Furnished office space outside the offices of the Blindness Prevention

Program will be needed. This will include an office for the project director, working space for the project administrator and secretary, table space for collating and storing survey forms. Space may be available at the Institute of Public Health and Nutrition in Mohakhali and may also be available in the National Institute of Preventive and Social Medicine.

### 3. Forms

Preliminary drafts of the four survey forms are attached. They will be field-tested by the project director and team leaders before being finalized.

### 4. Personal Equipment

Bedding and cooking gear will be required for each member of the field teams. In addition, lanterns, flashlights, umbrellas will also be needed.

### 5. Field Equipment

The teams will require scales, height sticks, length boards, small flashlights, paper, pens, etc. The ophthalmologists will need loupes and eye treatment (including vitamin A capsules, 200,000 IU). In addition, the teams will require xerophthalmia posters and training material. Each team will also be provided with a Kodak eye camera, to record photos of positive xerophthalmia cases; and calculators to compile data at the end of the day.

#### I. Collection of Blood Samples for Serum Vitamin A Estimation

To determine the correlation between vitamin A serum levels and reported night blindness, blood samples will be collected on children reported to be night blind in Dacca and its environs.

After the blood sample is obtained, it should be spinned and refrigerated the same day; then frozen and assessed within the month. Not less than 100, not more than 300 samples are required for this analysis. It is estimated

that a technician can process 10-20 samples per day. The Neeld and Pearson technique will be utilized, requiring a spectrophotometer. The method is specific enough with appropriate training.

IDDRC has indicated its intention to collaborate in this part of the survey. It is an appropriate institution to undertake this research, with relative staff, equipment, and experience.

#### J. Data Analysis

A summary sheet (form #4) will be completed after each sample site is finished. A copy of this form will be sent to Dacca and the actual survey forms kept with the team until they can be hand-carried to the project director. Preliminary analysis of the summary forms will give to the team progress reports and numbers of children being seen.

Mechanisms for final data-processing have been established. A data processing and computing consultant has been hired. HKI has its own entry data terminal. Data processing will take place in Dacca at the computing facilities at ICDDRB (SR-34).

A draft report will be written by the project director at the conclusion of the data analysis. This will be reviewed by the Ministry of Health and by Helen Keller International. The report will subsequently be released, reviewed by all interested parties (particularly UNICEF) and perhaps distributed at an international conference on vitamin A, possibly held in Bangladesh.

#### K. Time Frame

Initial preparation for the survey began in January 1981, when a feasibility study for the survey was undertaken in Bangladesh. It is anticipated that

22-

the project director will begin work in January 82 pending Government approval, space and vehicle commitments, and funding to cover costs.

The field survey will be undertaken during August through December. The two reasons for choosing this period are accessibility to distant rural areas, and uniformity of the climate. It is recognized that the major harvest is completed at the beginning of the dry season and nutritional status is probably at its best at this time. Therefore, the incidence of xerophthalmia lesions is probably at its highest August - December.

Training will begin in June with independent survey work initiated in the early part of August. The teams will regroup periodically (i.e., every four weeks) to discuss any problems, allow for a break from the field routine, assure quality control in restandardization of survey techniques, and undertake the urban sampling with a concentration of survey personnel. It is anticipated that the field work will take approximately four months to be concluded in December 1982. Although preliminary data review and feedback will be ongoing during the survey, final data analysis and report preparation will take place in the early part of 1983 (See Appendix III).

#### L. Budget

The total estimated budget is \$204,084 as outlined on page 20. The costs were determined in discussions with UNICEF and Bangladesh Government officials in Dacca during the feasibility study in February 1981. The total expenditures are about evenly divided between local costs and international expenses.

#### M. Administration

The protocol for the survey has been developed by HKI consultants at the request of the officials of the Ministry of Health and Population Control, Government of Bangladesh. The survey will be undertaken as a joint endeavor beginning in September 1981. HKI has accepted responsibility for the technical design of

23

the survey protocol, recruitment of project personnel to oversee the survey, general survey implementation and analysis, and securing external funds for its implementation. The Government of Bangladesh will assist in the selection of field personnel, provision of in-kind services (such as, seconding Ministry personnel to the project) and logistics, and additionally, shared responsibility for general survey operations.

BUDGET

BANGLADESH XEROPHTHALMIA PREVALENCE SURVEY

( \$ US)

SUMMARY

| <u>LINE ITEM</u>               | <u>COST</u>    | <u>COMMENTS</u>   |
|--------------------------------|----------------|---|
| <u>Salaries and Allowances</u> |                |   |
| International                  | \$62,500       | Project director,<br>HKI program officer (15%)<br>8 ophthalmologists (part-time)<br>4 team leaders, enumerators,<br>drivers, lab technician<br>data processing consultant |
| Local                          | 36,759         |   |
| Sub-Total                      | <u>99,259</u>  |   |
| <u>Transport</u>               |                |   |
| International                  | 15,500         | USA/Dacca (4), Dacca/Bangkok<br>(3)   |
| Local                          | 30,625         | Petrol, maintenance, supplementary ground transport   |
| Sub-Total                      | <u>46,125</u>  |   |
| <u>Equipment</u>               |                |   |
| Office                         |                |   |
| International                  | 500            | Cable, Telephone, Xerox<br>Stationery, duplicating, cable   |
| Local                          | 2,464          |   |
| Field                          | 5,367          | Forms, cameras, flashlights,<br>etc.  |
| Sub-Total                      | <u>8,331</u>   |   |
| <u>Data-Processing</u>         | 28,066         |   |
| <u>Final Workshop</u>          | 750            |   |
| <u>Report Production</u>       | 1,000          |   |
| <u>Contingency</u>             | 2,000          |   |
| Sub-Total                      | <u>185,531</u> |   |
| HKI Overhead (10%)             | <u>18,553</u>  |   |
| GRAND TOTAL                    | <u>204,084</u> |   |

25

BUDGET SUMMARY

BANGLADESH XEROPHTHALMIA PREVALENCE SURVEY

(\$ US)

|      |                                       |         |
|------|---------------------------------------|---------|
| I.   | Salaries and Allowances               | 99,259  |
| II.  | Travel and Transport                  | 46,125  |
| III. | Equipment                             | 8,331   |
| IV.  | Data processing                       | 28,066  |
| V.   | Report and final workshop             | 1,750   |
| VI.  | Contingency                           | 2,000   |
|      |                                       | <hr/>   |
|      | Direct Cost                           | 185,531 |
|      | Indirect Costs (10%* HKI<br>overhead) | 18,553  |
|      |                                       | <hr/>   |
|      | GRAND TOTAL                           | 204,084 |
|      |                                       | <hr/>   |

INPUTS

|        |                      |
|--------|----------------------|
| WHO    | 40,000               |
| DANIDA | 1,500                |
| CIDA   | 8,500                |
| AID/W  | 15,000 (Consultants) |
| USAID  | 100,000              |
| HKI    | 39,000               |

Note:

GOB contributing personnel, vehicles, office space and furniture.

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\* USAID allowable HKI overhead 8½% rate is now 10.7%

\* Per State 047662 approved overhead

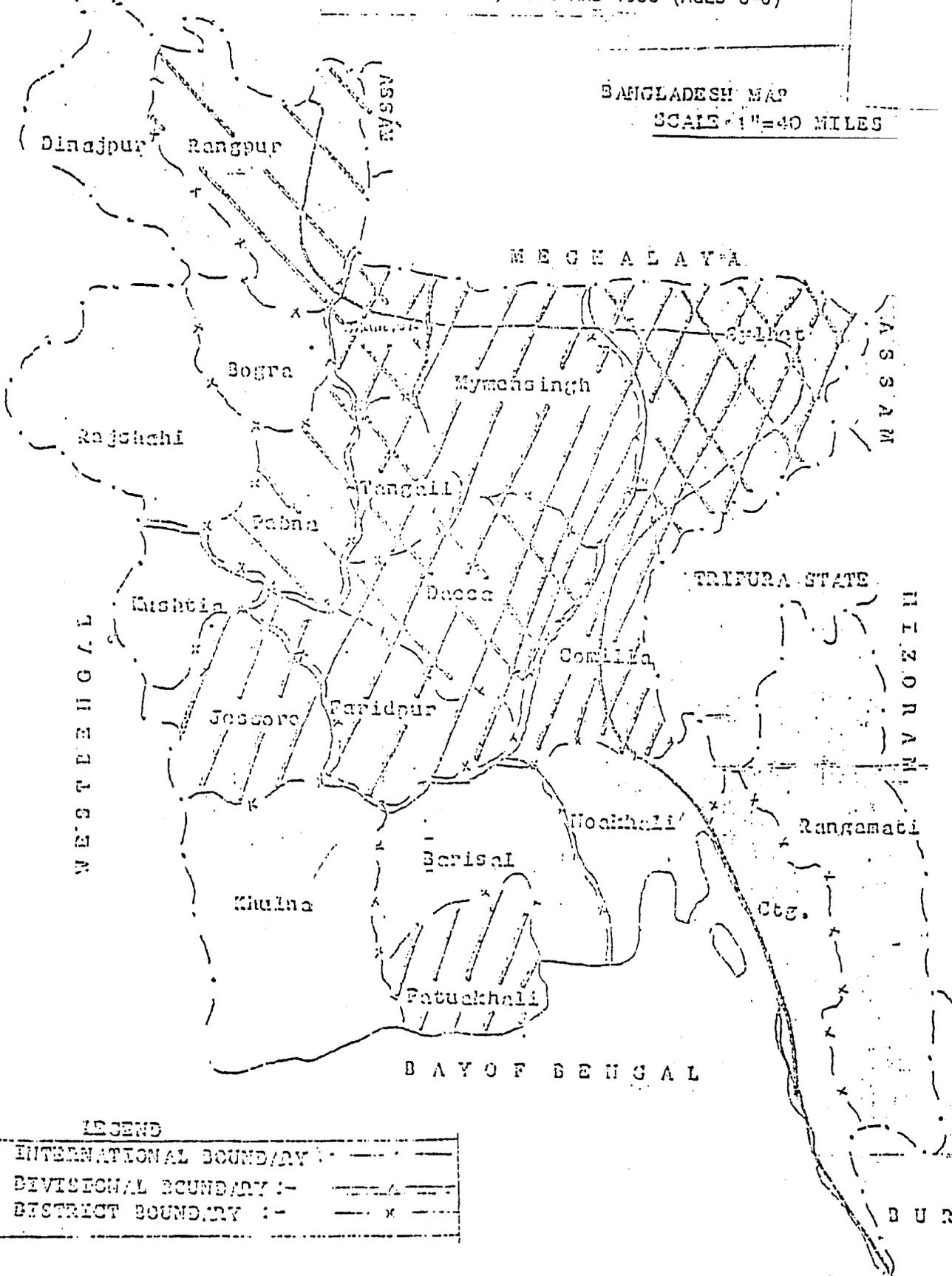
R E F E R E N C E S

1. Kamel, Wadie W. - Assignment Report on Blindness Prevention Programme, Bangladesh, WHO, SEA/Nut/41, 28 February 1973, South-East Asia Region.
2. Franken, S. - Blindness Prevention Programme in Bangladesh, WHO, SEA/Ophthal/4, 31 March 1975, South-East Asia Region.
3. World Health Organization - Vitamin A Deficiency and Xerophthalmia, Technical Report Series 590, WHO Geneva, 1976 (88 pages)
4. District Reports
5. UNICEF Reports
6. Northrup, Robert S. - Evaluations of the Blindness Prevention Programme, Bangladesh: A Critique of Past Efforts and Future Recommendations, Helen Keller International, April, 1980 (10 pages plus Recommendations).
7. Rahman, M. - Periodical Distribution of Large Doses of Vitamin A in Bangladesh. WHO Meeting on Vitamin A deficiency and xerophthalmia. Jakarta October, 1980.
8. Measham, Carol - Blindness Prevention Programme, Bangladesh, 1973-1980. Helen Keller International 1981 (25 pages plus appendices)

WEST BENGAL

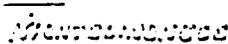
AREAS WITH HIGH PREVALENCE OF REPORTED NIGHT BLINDNESS, 1973 AND 1980 (AGES 0-6)

BANGLADESH MAP  
SCALE 1"=40 MILES



LEGEND

|                           |             |
|---------------------------|-------------|
| INTERNATIONAL BOUNDARY :- | ---         |
| DEVISIONAL BOUNDARY :-    | ----        |
| DISTRICT BOUNDARY :-      | -----x----- |

 > 1.5%  
 Areas

1973      1980  
        
 45-98%      09-77% (MORNING - 20000)  
 (1973-80)

MAP 1



SURVEY SCHEDULE AND TIMETABLE

| <u>TIME-PHASE</u>  | <u>ACTIVITY</u>  |
|--------------------|--|
| <u>1981</u>        |  |
| July - December    | Preliminary study design and questionnaire development   |
| November           | Selection of Project Director  |
| November-December  | Sample site definition<br>Arrangements for data processing   |
| December           | Vitamin A assay methodology review   |
| <u>1982</u>        |  |
| January-March      | Establishment of survey central head-quarters  |
| February-July      | Selection of headquarters' staff<br>Manual development<br>Questionnaire design and testing<br>Scheduling methodology for data analysis<br>Map sample sites<br>Preparation of timetable for field workers<br>Locate transport for field teams<br>Analyse questionnaire test results and print final forms |
| August             | Assemble and test field equipment<br>Train field teams<br>Standardize ophthalmologists and survey technique  |
| September-December | Field team examinations  |
| <u>1983</u>        |  |
| January            | Completion of data punching and verification   |
| February-April     | Data processing and analysis   |
| May-June           | Report preparation and presentation to GOB<br>Final workshop   |

GOVERNMENT OF BANGLADESH HKI XEROPHTHALMIA SURVEY NOVEMBER 1981 - MARCH 1982

FAMILY FORM

STUDY/FORM NUMBER 1 SAMPLE # (2-2) FAMILY # (3-2) DATE Day (4-9) Month (10-11) EXAMINER # (12-13)

DISTRICT \_\_\_\_\_ THANA \_\_\_\_\_ VILLAGE \_\_\_\_\_ PAPA \_\_\_\_\_ HOUSE NUMBER \_\_\_\_\_ HEAD OF HOUSEHOLD \_\_\_\_\_

| INDIVIDUAL #<br>(1-15) | NAME | AGE<br>16-17 | SEX<br>18 | PRESENT<br>19 | EXAMINED<br>20 | OTHER FORM<br>FILLED OUT<br>21 | POSITIVE EYE FINDINGS    |                                  |                          |                |                          |                             | AGE/SEX<br>CORRECTED<br>29 | 102<br>RANDOM<br>SAMPLE<br>30 | HEIGHT cm<br>31-32 | WEIGHT kg<br>33-34 |
|------------------------|------|--------------|-----------|---------------|----------------|--------------------------------|--------------------------|----------------------------------|--------------------------|----------------|--------------------------|-----------------------------|----------------------------|-------------------------------|--------------------|--------------------|
|                        |      |              |           |               |                |                                | RIGHT<br>BLINDNESS<br>22 | CONJUNCTIVAL<br>TRICHIASIS<br>23 | CORNEAL<br>Xerosis<br>24 | CATARACT<br>25 | CORNEAL<br>OPACITY<br>26 | CONGENITAL<br>ASTIGMA<br>27 |                            |                               |                    |                    |
| 1                      |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 2                      |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 3                      |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 4                      |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 5                      |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 6                      |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 7                      |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 8                      |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 9                      |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 10                     |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 11                     |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 12                     |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |
| 13                     |      |              |           |               |                |                                |                          |                                  |                          |                |                          |                             |                            |                               |                    |                    |

STATUS OF INTERVIEW 16 1 - COMPLETE 2 - INCOMPLETE 3 - REFUSED 4 - NO ONE HOME

GOVERNMENT OF BANGLADESH HKI XEROPHTHALMIA SURVEY NOVEMBER 1981 - MARCH 1982

## CLINICAL EXAMINATION FORM

STUDY/FORM NUMBER \_\_\_\_\_ (1)      SAMPLE # \_\_\_\_\_ (2-4)      FAMILY NUMBER \_\_\_\_\_ (5-7)

INDIVIDUAL NUMBER \_\_\_\_\_ (8-9)      DATE \_\_\_\_\_ DAY (10-11)      MONTH (12-13)

EXAMINER \_\_\_\_\_ (14-15)      VILLAGE NAME \_\_\_\_\_

PATIENT'S NAME \_\_\_\_\_ AGE \_\_\_\_\_ (16)      SEX \_\_\_\_\_ (17)

FINAL DIAGNOSIS \_\_\_\_\_ (18)

|                   |                        |                 |                    |
|-------------------|------------------------|-----------------|--------------------|
| 1 - XN            | 2 - Conj. xerosis      | 3 - Bitot spots | 4 - Cornea xerosis |
| 5 - Keratomalacia | 6 - Other corneal scar | 7 - Other       |                    |

PHOTO MADE? \_\_\_\_\_ (19)      1 - Yes      2 - No      - Unknown

PHOTO NUMBER \_\_\_\_\_ (20-22)

## GOVERNMENT OF BANGLADESH HKI XEROPHTHALMIA SURVEY NOVEMBER 1981 - MARCH 1982

## CLINICAL EXAMINATION FORM

|  |   |          |          | <u>Right Eye</u> | <u>Left Eye</u> |
|--|---|----------|----------|------------------|-----------------|
| A. <u>Estimated Potential VA of anterior segment</u> |   |          |          | <u>(23)</u>      | <u>(24)</u>     |
| 1 = better than 20/200                               |   |          |          |                  |                 |
| 2 = worse than 20/200                                |   |          |          |                  |                 |
| B. <u>Conjunctiva</u>                                |   |          |          |                  |                 |
|  |   | R.E.     | L.E.     | R.E.             | L.E.            |
| 1. Inflammation                                      |   |          |          |                  |                 |
| injected   |   | 1        | 1        |                  |                 |
| discharge  |   | <u>2</u> | <u>2</u> |                  |                 |
| Total  |   |          |          | <u>(25)</u>      | <u>(26)</u>     |
| 2. Consistency (Definite) Generalized                |   |          |          |                  |                 |
| Dry  | = | 1        | 1        |                  |                 |
| Wrinkling  | = | 2        | 2        |                  |                 |
| Thickening   | = | <u>4</u> | <u>4</u> |                  |                 |
| Total  |   |          |          | <u>(27)</u>      | <u>(28)</u>     |
| 3. Clinical Diagnosis                                |   |          |          |                  |                 |
| Conjunctival xerosis                                 | = | 1        | 1        |                  |                 |
| Bitot spot temporal                                  | = | 2        | 2        |                  |                 |
| Bitot spot nasal                                     | = | <u>4</u> | <u>4</u> |                  |                 |
| Total  |   |          |          | <u>(29)</u>      | <u>(30)</u>     |
| B. Cornea (Definite)                                 |   |          |          |                  |                 |
| 1. Consistency Dry                                   |   | =        | 1        | 1                |                 |
| Epithelial   | = | 2        | 2        |                  |                 |
| Stromal Ulcer  | = | <u>4</u> | <u>4</u> |                  |                 |
| Total  |   |          |          | <u>(31)</u>      | <u>(32)</u>     |

Rt. cornea

Lt. cornea

= dry

= erosion

= stromal ulcer

2. Active Keratomalacia

Generalized swollen =  
Localized swollen =

1  
2

Total

(33)

(34)

Generalized opaque =  
Localized opaque =

1  
2

Total

(35)

Generalized slough =  
Localized slough =

1  
2

Total

(37)

(38)

Rt. cornea

Lt. cornea

= swollen

= opaque

= slough

3. Keratomalacia

Descemetocaele =  
Fresh perforation =  
Staphyloma =

R.E. L.E.  
1 1  
2 2  
4 4

Total

(39)

(40)

Right cornea

Left cornea

= descemetocaele

= staphyloma

= perforation

4. Leukoma =

1 1

adherent leukoma =  
maculae/nebulae =

2 2  
4 4

Total

(41)

(42)

Right cornea

Left cornea

= maculae nebulae

= leukoma

= adherent leukoma

D. If old conical abnormality

R.E.

L.E.

Either eye:

1. Age at which lesion occurred

(43)

- 1 = 1 month old                      5 = 2 yrs
- 2 = 1-4 months old                  6 = 3 yrs
- 3 = 4-12 months old                7 = 4 yrs
- 4 = 1 year                            8 = 5 yrs

2. Other events 4 weeks or less

Before lesion appeared

R.E.    L.E.

|                        |   |          |          |
|------------------------|---|----------|----------|
| Eye trauma             | = | 1        | 1        |
| Measles                | = | 2        | 2        |
| Purulent eye infection | = | <u>4</u> | <u>4</u> |

Total

(44)

Was medicine applied to the eye before blind

- 1 = yes                                2 = no

(45)

3. Systemic events four weeks or less before lesion appeared (unknown - 9)

|                     |   |          |          |
|---------------------|---|----------|----------|
| Marked diarrhea     | = | 1        | 1        |
| Marked Malnutrition | = | 2        | 2        |
| Marked cough        | = | <u>4</u> | <u>4</u> |

Total

(46)

|       |   |          |          |
|-------|---|----------|----------|
| Fever | = | 1        | 1        |
| Worms | = | <u>2</u> | <u>2</u> |

Total

(47)

4. Diagnosis based on clinical examination and history:

- 1 = trauma
- 2 = measles
- 3 = purulent eye infection

35'

R.E.

L.E.

- 4 = congenital
- 5 = keratomalacia
- 6 = keratomalacia
- 9 = uncertain

(48)

H. Night Blindness

- Present:
- 1 = yes
  - 2 = no

(49)

Duration:

- 1 = 1 week
- 2 = 1-4 weeks
- 3 = 2 months
- 3-5 months
- 2 months
- 1 yr
- 7 = 2 yr
- 8 = uncertain

(50)

I. Cataract

- 0 = none
- 1 = congenital
- 2 = acquired

(51)

Age acquired

- 1 = 1 yr
- 2 = 1 yr
- 3 = 2 yr
- 4 = 3 yr
- 5 = 4 yr
- 6 = 5 yr
- 7 = 6 yr

(52)

Form #3

(BEING DEVELOPED)

GOVERNMENT OF BANGLADESH IHI XEROPHTHALMIA SURVEY NOVEMBER 1981 - MARCH 1982

FORM #4 - SUMMARY FORM

STUDY/FORM NUMBER \_\_\_\_\_ (1)      SAMPLE # \_\_\_\_\_ (2-4)      DAY \_\_\_\_\_ (5-6)      MONTH \_\_\_\_\_ (7-8)

TEAM LEADER \_\_\_\_\_ (9-10)

DISTRICT \_\_\_\_\_ THANA \_\_\_\_\_ VILLAGE \_\_\_\_\_

NUMBER OF HOUSEHOLDS VISITED \_\_\_\_\_ (11-13)

NUMBER OF COMPLETED INTERVIEWS \_\_\_\_\_ (14-16)

NUMBER OF INDIVIDUALS LISTED \_\_\_\_\_ (17-19)

NUMBER OF CHILDREN UNDER 6 LISTED \_\_\_\_\_ (20-22)

NUMBER OF CHILDREN UNDER 6 EXAMINED \_\_\_\_\_ (23-25)

NUMBER OF CHILDREN WITH NIGHT BLINDNESS \_\_\_\_\_ (26-28)

NUMBER OF CHILDREN WITH SIGNS OF XEROPHTHALMIA \_\_\_\_\_ (29-31)

GOVT. OF THE PEOPLE'S REPUBLIC OF BANGLADESH  
 INSTITUTE OF PUBLIC HEALTH NUTRITION  
 MOHAKHALI HEALTH COMPLEX

Dacca-12, Bangladesh,  
 Tel: 302255, 301723  
 4th February, 1982

No. IPHN/ 4-196/81/227

To  
 Dr. Susan T. Pettiss,  
 Director of Blindness Prevention,  
 Helen Keller International,  
 22 West 17 Street,  
 New York 10011 (212) 620-2113,  
 U.S.A.

Dear Dr. Susan,

As you are aware that the Government of Bangladesh is interested to conduct a Xerophthalmia Prevalence Survey in Bangladesh and they have already approved the Xerophthalmia Prevalence Survey Protocol, Bangladesh, 1981 - 1982 copy is attached herewith for information. Now it is a long time that the study is awaiting to take its real shape. The Government is very much interested to start the study without further loss of time. The necessary physical facilities and staff on deputation from the Government as committed for this study is now ready.

I therefore request you to kindly take necessary steps so that the study could be started at an early date.

Thanking you for cooperation,

Yours sincerely,

*M. H. Rahman*  
 DR. M. H. RAHMAN, 4.2.82  
 Director,  
 Instt. of Public Health Nutrition,  
 Mohakhali Health Complex,  
 Dacca, Bangladesh.

Copy for information to :-

- (1) Dr. A.I. Begum, Chief, Planning Cell, M/o Health & Population Control, (Health Division), Bangladesh Secretariat, Dacca.
- (2) Prof. Dr. M.A. Jalil, Addl. Project Director, Blindness Prevention Programme, Road No. .... House No. .... Dharmondi R.A., Dacca.
- (3) Dr. Nicholas Cohen, Representative, Helen Keller International, P.O. Box 6066, Gulshan, Dacca-12.