chment 1.
E SHEET)

ETHICAL REVIEW COMMITTEE, ICDDR,B.

cipal Investigator Radheshyam Bairagi   Trainee Investigator (if any)   2B

ication No. 95-023

Supporting Agency (if Non-ICDDR,B)

e of Study   Child Mortality in
atlab: Levels, Trends, Correlates and
ause of Death.

Project status:
( ) New Study
( ) Continuation with change
( ) No change (do not fill out rest of form)

le 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 informa-
   tion damaging to sub-
   ject or others   Yes (No)

oes the study involve:
a) Use of records, (hosp-
   ital, 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)

re 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   Yes (No)
d) Sensitive questions   Yes (No)
e) Benefits to be derived   Yes (No)
f) Right to refuse to
   participate or to with-
   draw from study   Yes (No)
g) Confidential handling
   of data   (Yes) No
h) Compensation &/or treat-
   ment 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 quest-
          ions 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 confidential-
          ity
    ____ 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 question-
        naire will be presented to the Cttee.
        for review.

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

Principal Investigator   Trainee

CHECK-LIST FOR SUBMISSION OF PROPOSALS
TO THE RESEARCH REVIEW COMMITTEE (RRC)
[Please tick (✓) the appropriate box]

1. Has the proposal been reviewed, discussed and cleared at the Division level ?

   Yes ☑

   No ☐

   If the answer is 'NO', please clarify the reasons: _____

   _____

2. Has the proposal been peer-reviewed externally ?

   Yes ☐

   No ☑

   If the answer is 'NO', please explain the reasons: _The project was involve_
   secondary data analysis only

3. Does the proposal address gender issues ?

   Yes ☑

   No ☐

   If the answer is 'NO', Please give the reasons.

   _____

   _____

4. Has a funding source been identified ?

   Yes ☐

   No ☑

   If the answer is 'YES', please indicate the name of the donor: _____

   _____

5. Whether the proposal is a collaborative one ?

Yes ☐

No ☑

If the answer is 'YES', the type of collaboration, name and address of the institution and name of the collaborating investigator be indicated:

_____

_____

_____

6. Has the budget been cleared by Finance Division ?

Yes ☑

No ☐

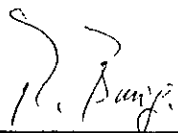If the answer is 'NO', reasons thereof be indicated: _____

_____

7. Does the study involve any procedure employing hazardous materials, or equipments ?

Yes ☐

No ☑

If the answer is 'YES', fill the necessary form.

September 27, 1995
_____
Date

R. Banji
_____
Signature of the
Principal Investigator

<u>RESEARCH PROTOCOL</u>

1. **Title of the Research Project:**

    Child Mortality in Matlab: Levels, Trends, Correlates
    and Cause of Death.

2. **Principal Investigator:**

    Radheshyam Bairagi
    Senior Scientist
    Population and Family Planning Division
    ICDDR,B

3. **Co-Investigators:**

    Santosh Chandra Sutradhar, Research Trainee, and
    Nurul Alam, Research Fellow
    Population Studies Centre
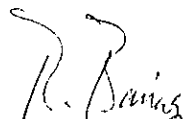   Population and Family Planning Division.
    ICDDR,B

4. **Starting Date:** 1 October 1995

5. **Completion Date:** 31 March 1996

6. **Total amount requested:** $38,973

7. **Source of Funding:** UNICEF/USAID

8. **Head of the Scientific Division:**

    _____
    Radheshyam Bairagi, D.Sc.
    Acting Division Director
    Pop and Family Planning Divn.

9. **Summary**

Despite a substantial decline in the last two decades, infant and child mortality in Bangladesh are still at an unacceptable level. The objective of this study is to find the levels, trends, correlates and cause of death of under-5 children in Matlab. Data for this study will come from the birth, death and migration files and also the database of the Matlab Demographic Surveillance System from 1966 to 1994. There are records of about 175,000 births and 25,000 deaths of under-5 children during this time. Socioeconomic data will come from the 1974 and 1982 socioeconomic surveys in the area. Survival time from birth to five years of age of each child will be considered as a dependent variable. The independent variable will be classified into two groups: long-term factors such as mother's education, mother's age, preceding and subsequent birth intervals, etc., and short-term factors such as housing status, possession of household goods, immunization status etc. All the independent variables of a child will be linked with the help of his/her unique identification number and his/her father's and mother's identification numbers. Data will be analysed mostly by cross classification, but for multivariate analysis a hazard model analysis technique will be used. The results of this study will be compared with the results obtained by Dr. Ken Hill of the Johns Hopkins University, using data from the three national surveys and a verbal autopsy of death study conducted in 1995. The results of the study are expected to be useful to the policy makers to develop appropriate interventions to reduce child mortality in this country.

10. **Project Description**

a)   Scope:

There has been a substantial decline in child mortality in the last two decades in Bangladesh (Huq and Cleland 1990; UNICEF 1994; Cleland and Streatfield 1992; ICDDR,B 1984, 1994). Yet, with infant mortality of about 100, and under-5 mortality of about 130, child mortality is a glaring problem in this country. To develop interventions necessary to meet this problem, it is important to know the factors responsible for the decline, and the factors that work as an obstacle to further decline of child mortality in this country.

In the past, an attempt has been made to investigate the levels, trends and correlates of child mortality and to examine cause of death of children in Bangladesh from data of three national surveys: the Bangladesh Fertility Survey 1974 (BFS 1974); the Bangladesh Fertility Survey 1989 (BFS 1989) and the Bangladesh Demographic and Health Survey 1993/94 (BDHS) (Hill 1995).

The preliminary results of this study suggest that, although there was no decline in child mortality for the period 1968-75, there was a linear decline after that at the rate of 3 percent until 1993. The author concludes that change in mother's education, birth interval, birth order, etc. did not contribute to mortality decline in this country, but other unknown factors may have been responsible for the decline. When he tried to investigate the short-term factors of child mortality of the last three years (1991-93) before the BDHS from that survey data, he got some of the following unexpected results:

- preceding birth interval did not have any effect on neonatal mortality (Koenig, et al., 1990a);

- measles vaccination did not have any effect on mortality of 12-23 months old children (Clemens, et al., 1988; Koenig, et al., 1990b);

- mother's education did not have any effect on mortality for any of these periods (Bhuiya and Streatfield 1991; Alam and Bairagi 1995); and the presence of a sanitary latrine in the household increased infant mortality in the household significantly.;

Hill's study also failed to demonstrate the effects of the 1971 Liberation War, the 1974-75 famine and the 1984 Shigella epidemic on mortality (ICDDR,B 1984, 1994). He collected cause of death information of all the under-5 deaths recorded in the BDHS in the last three years before the survey by a follow-up verbal autopsy. The result of this study was compared with the result of another verbal autopsy study conducted in the mid-1980s in the country. The author noted a radical change in cause of death structure of under-5 children over the period with a steep rise in the proportion of deaths due to respiratory infections, and a sharp decline in the proportion of deaths associated with diarrhoea.

A major limitation of Hill's study is that the quality of data was not evaluated. It was found from another study (Kabir and Amin 1995), that sex ratio at birth of the BFS 1989 survey was at an unacceptable level, particularly for uneducated mothers; and infant mortality in the BDHS 1993/94 was under-estimated (Bairagi, et al., 1995). In the retrospective data of a developing country, this type of problem is not unexpected. Poor quality of the data of that study might have been responsible for those unexpected findings and might have suppressed the effects of some other variables on child mortality. Moreover, it is not known that the quality and level of coverage of cause of death data of the two verbal autopsy surveys were the same.

The Matlab DSS data are free from all these errors. Of course one of the limitations of Matlab DSS data is that it may not be nationally representative. However, that limitation may affect

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the level of mortality and deaths due to diarrhoea, but should
not affect trends and correlates of mortality and the other cause
of death in the Comparison Area. The general objective of this
study is to identify the factors of child mortality in Matlab in
different periods, and the specific objectives are to find the
levels, trends and correlates of child mortality and cause of
death of under-5 children in Matlab during 1966-94.

b)   Methodology:

The Matlab DSS data, which already exist, will be used for this
study. These data are either in the flat files of birth, death
and migration or in the DSS database. Survival time from birth
to five years for each of the births will be calculated and used
as the dependent variable.

Survival time will be divided into neonatal, post-neonatal and 1-
4 years periods for analysis, because the mortality pattern and
its factors differ for these three periods. The independent
variables will be classified as short-term and long-term factors.
Long-term factors, which usually do not change throughout the
life time of a child, will be mother's education, father's
education, mother's age, birth interval, birth order, etc.; and
the short-term variables will be housing, possession of household
goods, area (Intervention vs. Comparison Areas), vaccination
status, etc. Classifications of cause of death in the Matlab DSS
are not the same over the study period. Causes of deaths will be
classified, in consultation with the experts, into ten to twelve
major groups to make it comparable for each period of time.

Independent variables will be available from the mother's file of
a child and also from the 1974 and 1984 socioeconomic surveys in
the area. Every individual, including new births, has a unique
identification number with village and household numbers. With
that identification number, the record of each child will be
linked with all the independent variables including his/her
household characteristics.

c)   Data and Analysis:

Each year there have been about 7,000 births in the Matlab DSS
area. Based on existing demographic statistics, this means we
will have information for about 175,000 births, about 17,500
infant and 25,000 under-5 deaths for the period of 1966-94. The
number of births and deaths is expected to be adequate for the
type of analysis we are planning to do.

Most of the analysis will be done by cross-tabulation and simple
statistical tests such as the χ^2 and proportion test. Hill
(1995) used Weibull Hazard Model for multivariate analysis. We
will first test the suitability of both the Cox and Weibull

Hazard Models and then use the more appropriate one for multivariate analysis. For Hazard Model analysis, mortality rate for different time periods will be done by the life-table technique. Death will be considered as an event, whereas migration, lack of follow-up for any other reasons, and age more than five years will be considered items for censoring. For finding the factors and cause of death, the number of births for 4-5 years may need to be combined to create a few segments over the study period.

11.   Significance of Expected Findings

The results of this study will be complementary to the results of Hill's work from three national surveys. Hill compared the cause of death structure for two periods with a difference of less than 10 years. We will be able to compare the cause of death structure over a period of about 30 years. The policy makers are expected to find the results of this study very useful to develop necessary interventions to combat child mortality in this country.

12.   Dissemination of Research Findings

The results of this study will be presented in a divisional meeting of the Population and Family Planning Division, in an Interdivisional Forum of the Centre and in a monthly seminar of the Population Studies Centre. It will also be presented at an international forum such as the Annual Meeting of the Population Association of America or the General Conference of the IUSSP. Eventually, the results of this study will be published in peer review journals.

13.   Protection of Human Subjects

Secondary data will be used and there will be no identification at the individual level. So the question of protection of the privacy of individuals does not arise.

14.   Budget

The study will need about $39,000, as detailed in the attached budget.   UNICEF and USAID will be approached for funding. If funding is not available from those sources, the study may be undertaken with internal resources.

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15. References

Alam A and R Bairagi (1995). "Levels, trends and differentials of discrimination against female children in rural Bangladesh". UNICEF, Dhaka. (Will appear as a technical report of the UNFPA, New York.)

Bairagi R, S Becker, A Kantner, K Allen, A Dutta, and K Purvis (1995). "Evaluation of the Bangladesh 1993-94 Demographic and health Survey within the Matlab Demographic Surveillance System: Initial Findings". Internatila Centre for Diarrhoeal Disease Research, Bangladesh, GPO Box 128, Dhaka 1000, Bangladesh. (Abstract is available in the Proceedings of the 1995 Annual Meeting of the Population Association of America).

Bhuiya A and K Streatfield (1991). "Mother's education and survival of female children in a rural area of Bangladesh". Population Studies 45:253-264.

Clemens, JD, BF Stanton, J Chakraborty, MR Rao, M Ali (1988). "Measles vaccination and childhood mortality in rural Bangladesh". American Journal of Epidemiology 128(6):1330-9.

Cleland J and K Streatfield (1992). "The demographic transition: Bangladesh" UNICEF Dhaka, Bangladesh.

Hill K (1995). "Child Mortality in Bangladesh: Levels, Trends and Correlates" Department of Population Dynamics, The Johns Hopkins University, 615 North Wolfe Street, Baltimore, Maryland 21205, USA.

Huq N and J Cleland (1992). "Bangladesh Fertility Survey 1989", National Institute of Population Research and Training (NIPORT), Dhaka, Bangladesh.

ICDDR,B (1984, 1994). Annual Report 1984, 1994.

Kabir R and R Amin (1995). "Infant and Child Mortality Levels and Trends in Bangladesh: An Update" Centre for Human Resource Development, Jahangirnagar University, P.O. Savar, Dhaka, Bangladesh.

Koenig MA, MA Khan, B Wojtyniak, JD Clemens, J Chakraborty, V Fauveau (1990). "Impact of measles vaccination on childhood mortality in rural Bangladesh". Bulletin of the World Health Organization 68(4):441-7.

Koenig MA, JF Phillips, OM Campbell and S D'Souza (1990). "Birth interval and child mortality in rural Bangladesh". Demography 27 (2):251-265.

Mitra SN, MN Ali, S Islam, AR Cross, and T Saha (1995). "Bangladesh Demographic and Health Survey 1993-94", National Institute of Population Research and Training (NIPORT), Dhaka, Bangladesh.

UNICEF (1994). "The state of the world children", United nations Children's Fund.

16. Detailed Budget

Personnel:	Rate per month	Man month	Project's requirement
Dr. R. Bairagi	$9,300	2	$ 18,600
Santosh Ch. Sutradhar Research Trainee	$ 150	6	$ 900
Nurul Alam Research Fellow	$ 700	3	$ 2,100
Sr. Programmer	$ 550	1	$ 550
Total Personnel Cost:			$22,150

Supplies & Materials: Office supplies, paper, diskette, etc.	$ 1,000
Communication: Postage, fax, etc.	$ 200
Local Travel: Dhaka/Matlab travel	$ 200
Other Inter-departmental Cost: Photocopying, land transport, etc.	$ 200
Computer Charge (mainframe):	$ 2,000
Dissemination: (including presentation in international forum)	$ 4,000
Total Other Direct Cost:	$ 7,600
Total Personnel and Other Costs:	$ 29,750
Overhead (31%)	$ 9,223
Grand Total	$ 38,973

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