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ETHICAL REVIEW COMMITTEE, ICDDR,B Dhaka-12

Date 12.3.83
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chment 1.

Principal Investigator **MARIAN CRAIG** Trainee Investigator (if any) _____

Application No. **83-008P**   Supporting Agency (if Non-ICDDR,B) _____

Title of Study **MAPPING THE MATLAB STUDY AREA**   Project status:
(✓) New Study
( ) Continuation with change
( ) No change (do not fill out rest of form)

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

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

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

Does the study involve:
(a) Use of records, (hospital, medical, death, birth or other) (Yes) No
(b) Use of fetal tissue or abortus   Yes No
(c) Use of organs or body fluids   Yes No

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

5. Will signed consent form be required:
   (a) From subjects   Yes No NA
   (b) From parent or guardian (if subjects are minors) Yes No NA
6. Will precautions be taken to protect anonymity of subjects Yes No NA
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)
   NA Statement given or read to subjects on nature of study, risks, types of questions to be asked, and right to refuse to participate or withdraw (Required)
   NA Informed consent form for subjects
   NA Informed consent form for parent or guardian
   NA Procedure for maintaining confidentiality
   NA Questionnaire or interview schedule *
   * If the final instrument is not completed prior to review, the following information should be included in the abstract summary:
   1. A description of the areas to be covered in the questionnaire or interview which could be considered either sensitive or which would constitute an invasion of privacy.
   2. Examples of the type of specific questions to be asked in the sensitive areas.
   3. An indication as to when the questionnaire will be presented to the Cttee. for review.

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

Marian Craig
Principal Investigator

Trainee

SECTION I - RESEARCH PROTOCOL

1. **Title:**   Mapping the Matlab Study Area

2. **Principal Investigator:**   Marian Craig

3. **Co-investigator:**   A.M. Sarder   Supervisor: Dr. Stan D'Souza

4. **Starting Date:**   March 30th, 1983

5. **Completion Date:**   June 30th, 1983

6. **Total Direct Cost:** $ 1,280.83

7. **Scientific Programme Head:**

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

   *Signature of Scientific Programme Head: _____

                             Date: 15 Feb 1983

   *This signature implies that the Scientific Programme Head takes responsibility for the planning, execution and budget of this particular protocol.

8. **Abstract Summary:**

No detailed and accurate maps exist for the Matlab study area. It is useful to map data for two reasons. Firstly, its visual representation aids interpretation. Secondly, spatial relationships are significant in themselves, processes occur in, and are affected by, space. It is proposed to construct a bari map of Matlab, sufficiently detailed to locate individual families. A combination of mouza maps and tracings of aerial photographs, both at a scale of 1:4,000 (approximately), or 16": 1 mile, will be distributed to the community health workers and female village workers of the Matlab field trial area. Each worker will be given the sheet(s) relevant to her area of responsibility and asked to mark thereon the family census numbers. The master map prepared by combining the resultant 120 maps will then be available for all ongoing and future work in the Matlab study area. Examples of its useful application are in the study of the time-space diffusion of Vibrio cholerae; and the investigation of the relationship between bari characteristics and contraceptive prevalence.

ABSTRACT SUMMARY

None of the questions for the Ethical Review Committee apply because this study involves only old data sets, and will not involve contact with any patient or population surveyed.

A., INTRODUCTION

1.   Objective

No detailed and accurate maps exist for the Matlab field trial area of the ICDDR,B, probably because to date no one has approached research topics from a specifically geographical angle. Apart from sketch maps, albeit detailed, of some villages commissioned for community studies[1], the only existing map is a sketch map at a scale of 1:190,000 (1":3 miles) showing the location of villages in the field trial area. The basic objective of this limited study is to make good this   lack by constructing a base map of the field trial area at a scale of 1:4000, which will show family location.

2.   Background

It is useful to map data for two reasons. Firstly, because its presentation in the striking visual form of a map enhances interpretation of that data. Secondly, because spatial relationships are significant in themselves. All processes have a spatial dimension which affects those processes, beyond merely describing them. The relevance of this for the study of infectious disease is stated succinctly by MacMahon and Pugh (1960): 'The importance of variation in the frequency of different (diseases) from place to place ... has formed the basis of much reasoning leading to hypotheses of etiology' and 'the knowledge of the geographic distribution of disease has obvious utility for administrative purposes'. Clearly, the smaller, geographically, the administrative areas examined, the more accurately the boundaries of high or -

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[1]See, for example, the sketch maps drawn for the study by Curlin et al., 1977 on the relationship between drinking tubewell water and diarrhoea rates.

low disease frequency can be drawn. A classical example of detailed mapping throwing light on an etiological hypothesis is John Snow's investigation of an outbreak of cholera in London in 1848. Recent work (See Feachem, 1982, p.4) suggests that the conclusions reached by Snow himself about the significance of spatial variations in disease incidence have been misrepresented. Nevertheless it remains an excellent example of the value of spatial analysis for epidemiology. At the other end of the spatial scale, maps have proved an effective means of describing the global cholera pandemics. See, for example, the global map of cholera distribution, between 1800 and 1957, in Pollitzer (1959); and the article by Felix & Dodin (1981) on the evaluation of the global epidemiology of cholera between 1970 and 1980.

This author proposes to examine the spatial diffusion of Vibrio cholerae through the Matlab field trial area during the Autumn, 1982 epidemic, which study is addressed in a parallel limited study protocol. In order to make a detailed comparison of the patterns of spread of the Classical and El Tor biotypes, it will be necessary to map at the intra-village level. It is argued that the resulting map, which will show the location of every family in the Matlab field trial area, will be an excellent resource for all work in Matlab. One example of its useful application would be in Makhlisur Rahman's (1982) study of the determinants of areal variation in contraceptive practices in Bangladesh, which emphasises the importance of simple inter-and intra village variation in bari size. Morbidity studies which must take into account distances and journey times from Matlab cholera hospital would clearly benefit from such a detailed map.

B. **SPECIFIC AIM**

To construct a base map of the Matlab field trial area, at a scale of 1:4,000 (approx. 16":1 mile) showing the location of every family monitored by the demographic surveillance system.

C. **METHODS AND MATERIALS**

The study design is based on a feasibility study carried out in Matlab in January. This is described in detail in Appendix A. A combination of two kinds of map information will be used:-

1. Mouza maps (Scale, 1: 4,000 or 16": 1 mile).

2. Tracings of aerial photographs (enlarged to a scale of 1: 4,000).

The mouza maps will be used to delimit village boundaries precisely, and to identify three or four reference baris in each CHW's or FVW's area of responsibility. (See below for further explanation.) The tracings of aerial photographs will show tree clump outlines and ponds, and important features such as khals, pucca roads and bazars. (Some of this information will be transferred to the tracings from the mouza maps.) On these tracings, CHWs or FVWs will enter 1974 family census numbers, or later numbers in cases of bari-splitting or families settling since 1974. The feasibility study indicated that CHWs think in terms of 1974 numbers most readily. It is argued that it is essential to enlist the help of CHWs and FVWs in this mapping exercise for two reasons. Firstly, this is the only way to make it logistically feasible, given that approximately 3,500 baris must be identified. Secondly, they have the best mental maps of their areas of responsibility and are therefore best able to locate their families.

Study Design

The construction of the map will take place in 5 stages:

1. Tracing of tree clump outlines, ponds and important features such as pucca roads, khals and bazars from 1 : 4,000 enlargements of 1975 aerial photographs for the Matlab field trial area. Overlaying these tracings on mouza maps for delimitation of village boundaries and entry of some important features. Allocation of relevant mouza maps and tracings to FVWs and CHWs.

2. Distribution of mouza maps and overlays to block supervisors and FVW supervisors for entry of three or four reference baris.

3. Distribution of mouza maps and overlays to CHWs and FVWs at block meetings, or salary day meetings. A demonstration lecture will be given by the author, with the help of the supervisors. Simple written instructions, and an example map/overlay will be distributed with the maps. The workers will be requested to locate family census numbers within the relevant tree clump outlines on their overlays.

4. Collection of completed maps at the subsequent group meeting. The feasibility study suggested that this task will not be unduly time-consuming, and will therefore fit into the workers' routine activities (See Appendix A).

5. Cross-checking of accuracy of family location for a sub-sample of villages, by the author, with the help of senior health assistants.

6. Lists of "Cholera Villages" from E.Coli Tape.

7. Compiling of master map.

Timetable

It is not possible to give an accurate commencement date. This
entirely depends on how long the application to the Surveyor General for
permission to use aerial photographs takes. Six weeks from the date of
application is a reasonable estimate for this. Under this assumption:

March 30 - April 16th: Tracing of aerial photographs. Division of mouza
maps and tracings into field workers' areas of
responsibility.

April 17th - April 24th: Distribution of maps to senior health assistants
for entry of reference baris.

April 25th - May 26th: Distribution of maps,to senior health assistants
for entry of family census numbers. Collection of
completed maps.

May 26th - June 9th: Checking of map accuracy by author and senior health
assistants.

June 9th - June 25th: Construction of master map.

D.   RATIONALE AND SIGNIFICANCE

It is suggested that a 1: 4,000 map of the Matlab field trial will
represent a significant addition to the research tools available for analysis
of the large, rich data sets collected in the Matlab field trial area.
Although this protocol addresses itself simply to the construction of a base
map, such a map is the first step in   mapping a wide range of environmental
and socio-economic variables whose spatial distribution is related to morbidity.

mortality and fertility variables. For example, environmental determinants
of cholera epidemiology are attracting more and more attention. Significant
areal variation in contraception prevalence has been apparent in Matlab for
some time now. Any attempts to design an improved morbidity surveillance
system will benefit from detailed knowledge of the spatial incidence of
disease.

When the master map has been compiled, family locations will be geocoded,
using computer mapping facilities in the Department of Geography of the
University of Cambridge, U.K. This will enable rapid mapping in the future
of all data available by family, and of course village, in the Matlab field
trial area. The potential for rapid monitoring of epidemics is clearly
considerable.

E.   FACILITIES REQUIRED

1.   Permission to trace aerial photographs from the Surveyor General
     of Bangladesh.

2.   Mouza maps for all villages in the Matlab Field Trial Area,
     available from the Land Survey Department.

3.   50 man-days of tracing time.

4.   Eventually, access to computer mapping facilities of the geography
     department of the University of Cambridge.

5.   Most of the mapping work in the field will be carried out by deployment
     of existing staff in the Matlab field trial area.

F. COLLABORATIVE ARRANGEMENTS

1. (Possibly) Bangladesh Space Research and Remote Sensing Organisation,
    depending on the form in which the Surveyor General grants permission
    to use aerial photographs.

2. Department of Geography, University of Cambridge, for use of computer
    mapping facilities.

REFERENCES

Curlin, G.T. et. al., 1977. "The Influence of Drinking Tubewell Water
    on Diarrhoea Rates in Matlab Thana, Bangladesh" ICDDR,B Working
    Paper No.1. (reprinted in 1980).

Feachem, R. 1982. "Environmental Aspects of Cholera Epidemiology:
    III. Transmission and Control" Trop. Dis. Bull. 7a, 1:1-47.

Felix, H. and Dodin, A. 1981. "Epidemiologie Mondiale du Cholera:
    Evolution entre 1970 et 1980" Bull. Soc. Pathol. Exot. Filiales.

MacMahon, B. et al., 1960. Epidemiologic Methods; Chapter 9.

Pollitzer, R. 1959, Cholera; Chapter 1.

Rahman, M. 1982. "Determinants of Areal Variation in Contraceptive
    Practices in Bangladesh".

SECTION III - BUDGET

A. DETAILED BUDGET

1. PERSONNEL 'SERVICES

Name	Position	% Effort	Project Taka	Requirement US$
Marian Craig	PI	100	*	-
Mr. A.M. Sardar	Co-investigator .		-	
Matlab Field Trial Area Staff		The required tasks will fit easily into the staff's existing routine.		
Tracer (1)		100	2,000	

2. SUPPLIES AND MATERIALS

Mouza maps (170 @ Tk. 12/-Minimun)	2,040
Photographic paper (possibly);100 sheets; size 29"x24" (@ Tk. 30 per sheet)	20,000
Celluloid acetate 85 yards @ Tk. 25	2,200
Xeroxing	1,000
Trips to Matlab by Principal Investigator	1,500
Computer time	2,000
	30,740

Total cost in Dollars (24 Takas=1US $) =
$ 1280.83