

Principal Investigator John D. Snyder

Trainee investigator(if any) _____

Application No 79-004

Supporting Agency(if Non-CRL) _____

Title of study Paralytic Poliomyelitis

Project status:

Survey

() 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):

1. Source of Population:

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

2. Does the study involve:

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

3. 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

4. Are subjects clearly informed about:

- a) Nature and purposes of study Yes No
b) Procedures to be followed including alternatives used Yes No
c) Physical risks Yes No
d) Sensitive questions Yes No
e) Benefits to be derived Yes No
f) Right to refuse to participate or to withdraw from study Yes No
g) Confidential handling of data Yes No

5. Will signed consent form be required:

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

6. Will precautions be taken to protect anonymity of subjects: Yes No

7. Check documents being submitted herewith to Committee:

____ Umbrella proposal - Initially submit an overview (all other requirements will be submitted with individual studies).
✓ Protocol (Required)

✓ Abstract summary (Required)

✓ Statement given or read to subjects on nature of study, risks, types of questions to be asked, and right to refuse to participate or withdraw (REQUIRED)

____ Informed consent form for subjects

____ Informed consent form for parent or guardian

____ Procedure for maintaining confidentiality

____ Questionnaire or interview schedule

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

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

I agree to obtain approval of the Review Board on Use of Human Volunteers for any changes involving the rights and welfare of subjects before making such change.

John D. Snyder
Principal Investigator

Trainee

79-004
Rec'd 27/4/79

SECTION I - RESEARCH PROTOCOL

1. Title: Survey to Determine the Prevalence of Paralytic Poliomyelitis
2. Principal Investigator: John D. Snyder, M.D.
3. Starting Date: May 1, 1979
4. Completion Date: July 1, 1979
5. Total Direct Cost: \$1,141 (Incremental Cost - \$299)
6. Abstract Summary:

This study will estimate the annual prevalence of poliomyelitis among children 5 to 14 years of age in the Matlab Field Surveillance Area. From this information an estimate of the average annual incidence for the population can be determined.

By clinically evaluating lameness of individuals, this study will allow for determination of prevalence of poliomyelitis among a specific age group of children. Since lower limb involvement is seen in 78 to 86 percent of cases of paralysis due to poliomyelitis in young children (6-8), using lameness as the criteria for diagnosis should identify approximately 80 percent of these cases. All cases of lameness in the 5 to 14-year age group will be ascertained by female village workers and the diagnosis of polio will be made by use of answers to a lameness history questionnaire and a physical examination. The average annual incidence of polio can then be calculated, and from this data the potential efficacy of a polio immunization program can be estimated:

- (a) Since polio virus infections in developing countries without immunization programs occur almost entirely before 5 years of age, evaluation of a group of children 5 years or older should reflect the non-fatal cases of polio with residual paralysis that occurred in that group from years 0 to 4. For this study, the selected group will include children from 5 to 14 years of age who have lameness.
- (b) No risks are anticipated.
- (c) Interviews will be conducted in a professional manner by field assistants under supervision of physicians, and physical exams will be done by physicians.

- (d) Data will be kept in a locked filing cabinet with access only to the investigators. No names or village numbers will be used in the analysis and use of the data.
- (e) Since no potential risks are anticipated, we will explain the purpose and intent of the interviews and physical exam to each participant and his parent/guardian and ask their verbal consent for participation.
- (f) The interviews will be conducted in the participants' homes and will be conducted by trained field assistants under the supervisor of physicians. Physical exams will be conducted in the homes by physicians, and the interview and physical exam should each require about 10 minutes for completion. (See attached forms.)
- (g) If a treatable cause of lameness is discovered, appropriate intervention will be taken to aid the individual. Since most of the causes of lameness will be unremediable, a greater benefit for the society can be anticipated if the study shows a potential benefit from preventative interventions - in this case, polio vaccination.
- (h) The survey will make use only of the Matlab demographic data to ascertain the ages of the persons with lameness.

7. Reviews:

- (a) Research Involving Human Subjects: _____
- (b) Research Committee: _____
- (c) Director: _____
- (d) BMRC: _____
- (e) Controller/Administrator: _____

SECTION II - RESEARCH PLAN

A. INTRODUCTION

1. Objective

The study will estimate the prevalence of paralytic poliomyelitis among children 5 to 14 years of age in villages of the Matlab Surveillance Area.

2. Background

Infection with Poliovirus hominis is almost universal in most areas of the world; however, paralytic poliomyelitis has been associated in the past with epidemics among older children and adults in developed countries of temperate regions. Infection in tropical countries with poor sanitation occurs in children less than 5 years of age, when it is generally felt to result in a higher proportion of non-paralytic illnesses (1). Thus, it is often stated that paralytic poliomyelitis is relatively rare (less than 1 per 1,000 children affected) in developing countries, but increases when improvements in sanitation limit early exposure to poliovirus (2, 3). However, recent studies in rural Ghana challenge this assumption by demonstrating a prevalence of 6-7 per 1,000 school-age children (4, 5). The estimated annual incidence of paralytic poliomyelitis, calculated from this data, is as high as that in the United States during the years of the worst epidemics.

In order to determine the optimal immunization priorities and strategies for developing countries, it would be useful to document the prevalence and epidemiology of paralytic poliomyelitis in Bangladesh. A study similar to that carried out in Ghana, could be done in the Matlab field area. Lower limb involvement was shown in 78 to 86 percent of childhood polio cases (onset under 5 years of age) in studies done in Nigeria, India, and Liberia (6-8). Therefore, using lameness as a criteria for diagnosis, approximately 80 percent of the cases will be identified (9). (Since the legs are affected in 90 percent of cases of paralytic poliomyelitis, residual paralysis or "lameness" can be easily assessed.) Using certain unique characteristics of the progression of disease and its physical sequelae, a diagnosis of poliomyelitis can be made with a high degree of accuracy (4).

3. Rationale

If the incidence of poliomyelitis in rural Bangladesh approximates that seen in Ghana and Cameroon (5, 10), data will be provided to help determine optimal immunization priorities and strategies for developing countries.

B. SPECIFIC AIMS

By determining the prevalence of polio in a specific age group, the average annual incidence of polio in the population can be calculated.

C. METHODS

1. Location: The 40,000 population of the non-Health Services Area of Matlab.
2. Time Period: May 1, 1979 to June 1, 1979.
3. Study Subjects: Children 5-14 years with lameness.
4. Study Procedures: The study will be explained to the female village workers in the Matlab Health Services Area during their regular biweekly meeting. They will be asked to provide, at the next meeting, a list of children aged 5 to 14 years from their village, who meet an initial definition of "lameness." Lameness is defined as "not being able to walk properly or having one leg shorter or smaller than the other." In Bengali, the following phrase will be used:

আমনার পরিবারে খোঁড়া, লেন্ড়া, আঁড়ুর অথবা নামের
অবস্থা বোঝের কোন ব্যক্তি আছে কি?

After the lists are collected, each child with lameness will be visited by one of the investigators, who will observe the child's gait, obtain measurements of limb size, and perform a neuromuscular examination as well as complete a history questionnaire. Lameness will be attributed to poliomyelitis if the case meets these criteria:

- (a) Must have muscle weakness and atrophy;
- (b) Must have diminished deep tendon reflexes;

- (c) Must not have diminished sensitivity to pinprick;
- (d) Should have a history of acute onset with no progression.

There are approximately 12,000 children, aged 5 to 14 years, in the proposed study population of 40,000. If the prevalence rate is only 1 per 1,000 children, there would be 12 cases of lameness due to poliomyelitis. However, if the rate is 7 per 1,000, as in the recent survey in rural Ghana, there would be 84 cases.

Children with lameness attributed to poliomyelitis will be analyzed for prevalence by age and sex and by village of residence. The age- and sex-specific populations for the study area in 1978, will be used in calculation of prevalence rates.

Since almost all polio virus infections, in an area like rural Bangladesh, would be expected to occur within the first 5 years of life, the average annual incidence for the population can be determined by dividing the prevalence rate in children 5 to 14 years of age by 5 and multiplying by the proportion of the population 0 to 4 years of age. Cases will be further analyzed by reported year of onset to determine if the incidence of poliomyelitis fluctuates from year to year.

D. SIGNIFICANCE

See Rationale.

E. FACILITIES REQUIRED

1. Office Space: One room in the Matlab facility with desk, table, and file cabinet.
2. Laboratory Space: None.
2. Hospital Resources: None.
4. Animal Resources: None.
5. Logistical Support: None.

/6...

6. Major Items of Equipment: None.

7. Other: None.

F. COLLABORATIVE ARRANGEMENTS

None.

REFERENCES

1. Gear, J. Poliomyelitis in Diseases of children in the subtropics and tropics. Second edition, Jelliffe, D. B., editor; Edward Arnold Ltd.
2. The Lancet. The world's poliomyelitis (editorial), 2:646, 1970.
3. Cockburn, W. C., Drozdoz, S. C. Poliomyelitis in the world. Bull. WHO, 42:405, 1970.
4. Nicholas, D. D., Kratzer, J. H., Ofosu-Amaah, S., Belcher, D. W. Is poliomyelitis a serious problem in developing countries - the Danfa experience. Br. Med. J., , 1009, 1977.
5. Ofosu-Amaah, S., Kratzer, J. H., Nicholas, D. D. Is poliomyelitis a serious problem in developing countries - lameness in Ghanaian schools. Br. Med. J., , 1012, 1977.
6. Collins, W. R. F., Ransome-Kuti, O., Taylor, M. E., Baker, L. E. Poliomyelitis in Nigeria. The W. A. M. J., 10:217-222, 1961.
7. Gupta, A. K., Gulati, S. K. Poliomyelitis in Kampur during the year 1964. J. Indian M. A., 51:230-233, 1968.
8. Bada, J. L. Paralytic poliomyelitis in Monrovia (years 1964-67). J. Trop. Med. Hyg., 71:212-215, 1968.
9. Le Force, F. M. Clinical survey techniques to measure prevalence and annual incidence of poliomyelitis in developing countries. WHO paper, 1979.
10. Guyer, B., Barette, M., Makinen, W. M. Surveillance de la poliomyelite de forme paralytique à Yaoundé, Cameroun 1973-1975. Afr. Med., 15:697-704, 1976.

SECTION III - BUDGET

A. DETAILED BUDGET

1. PERSONNEL SERVICES

<u>Name</u>	<u>Position</u>	<u>% or # of Days</u>	<u>Monthly Salary</u>	<u>Project Requirements</u>	
				<u>Taka</u>	<u>Dollar</u>
Dr. R. E. Black	Investigator	10%	\$ 4,250	-	425
Dr. J. D. Snyder	"	30%	1,000*	-	300
Dr. Baqui	"	20%	Tk. 2,750	550	-
(To be named)	Field Asst. (2)	30%	Tk. 1,562	937	-
"	FVW (20)	10%	Tk. 16/day	160	-
"	Boatman	30%	Tk. 11/day	110	-
Sub-Total				1,757	725

2. SUPPLIES

<u>Items</u>	<u>Unit Cost</u>	<u>Amount Required</u>	<u>Project Requirements</u>	
			<u>Taka</u>	<u>Dollar</u>
Pens and paper	-	-	150	-
Xeroxing questionnaires and P.E. forms	Tk. 1.50/sheet	250	375	-
Sub-Total			525	-

3. EQUIPMENT

None

4. PATIENT HOSPITALIZATION

None

5. OUTPATIENT CARE

None

* Cost to ICDDR,B for one month of stay in Bangladesh.

6. ICDDR,B TRANSPORT

Project Requirements

Taka Dollar

Dacca/Matlab/Dacca - one
per week (2 trips @ Tk. 300/
trip)

600

Speedboat (30 hrs. @ Tk. 98.84/hr)

2,965

Sub-Total

3,565

7. TRAVEL AND TRANSPORTATION
OF PERSONS

Local travel - none
International travel - none

8. TRANSPORTATION OF THINGS

One box of forms - cost of
transport included in ICDDR,B
Transport

9. RENT, COMMUNICATION AND
UTILITIES

Postage - none
Telephone - none
Rent - none

10. PRINTING AND REPRODUCTION

Forms and record sheets

400

Sub-Total

400

11. CONTRACTUAL SERVICES

Computer time - none

B. BUDGET SUMMARY

	<u>Taka</u>	<u>Dollars</u>
1. Personnel	1,757	725
2. Supplies*	525	-
3. Equipment	-	-
4. Patient Hospitalization	-	-
5. Outpatient Care	-	-
6. ICDDR,B Transport*	3,565	-
7. Travel - Persons	-	-
8. Transportation - Things	-	-
9. Rent/Communications	-	-
10. Printing/Reproduction*	400	-
11. Contractual Services	-	-
12. Construction	-	-
Total	<u>6,247</u>	<u>725</u>

Dollar cost (Tk. 15/\$) = 1,141

* Incremental cost = Tk. 4,490 or \$299.

PARALYTIC POLIOMYELITIS SURVEY

Date Interview _____

Interviewer _____

Doctor _____

Name _____

Village _____ Bari _____

Census No. _____

Age _____ years _____ mos. Sex _____

Birth date _____

Birthplace _____

History of Lameness

Yes No Don't Know

1. Has lameness been present since birth?

2. When did lameness begin: Age _____

Date _____

Place Residing _____

3. Did lameness follow injury, such as a fall, a blow, or a crushing accident?

If yes, explain _____

4. Did lameness follow illness?

5. If yes, did the illness include:

Headache

Fever

Vomiting

Nasal congestion

Stiff neck

Convulsions

Coma

Sore and stiff muscles

	<u>Yes</u>	<u>No</u>	<u>Don't Know</u>
6. How did lameness begin. Explain onset (e.g. sudden vs. gradual): _____			
7. When the lameness started, was there also weakness or paralysis of one or both arms? _____			
8. Since the lameness began, has it: Stayed Improved _____ Same _____ Worsened _____ Explain _____			
9. Are the following sensations present:			
Touch 	_____	_____	_____
Pain 	_____	_____	_____
Heat and cold	_____	_____	_____
10. Is the lameness in:			
One leg (R _____, L _____) 	_____	_____	_____
One arm (R _____, L _____) 	_____	_____	_____
Both legs 	_____	_____	_____
Both arms 	_____	_____	_____
Other _____			
11. Does the person have control of his urinary bladder?	_____	_____	_____
12. Has the person had a tonsilectomy?	_____	_____	_____
13. Has the person ever been given polio vaccine?	_____	_____	_____
If yes, explain _____			
14. Degree of disability:			
a. Pronounced but can walk without mechanical aid	_____	_____	_____
b. Walk with prosthesis	_____	_____	_____
c. Unable to walk	_____	_____	_____
15. Final diagnosis (circle):			
a. Poliomyelitis			e. Tumor
b. Upper motor neuron palsy			f. Myasthenia gravis
c. Congenital (clubfoot, genu valgum)			g. Demyelinating encephalomyelitis
d. Trauma			h. Other _____

Physical Examination

1. Cranial nerves (II thru XII): _____

2. Muscle strength (graded 0 to 5):

	<u>Strength</u>		<u>Flaccid</u>			
			<u>Yes</u>	<u>No</u>	<u>Don't</u>	<u>Know</u>
Neck						
Upper arm	R _____	L _____				
Forearm						
Hand						
Upper leg						
Lower leg						
Foot						

3. Fasciculations present:

Location _____

4. Circumference of limbs:

Upper arm (15 cm proximal to medial epicondyle)	R _____	L _____
Forearm (10 cm distal to medial epicondyle)		
Thigh (15 cm proximal to tibial plateau)		
Calf (20 cm proximal to lower edge of medial malleolus)		

5. Muscle tone:

Atonia ____ Hypotonia ____ Normal ____ Hypertonia ____ Rigidity ____

Muscle group involved _____

6. Reflexes (graded 0 to 4+):

Biceps	R _____	L _____	Knee	R _____	L _____	Abdominal	_____
Supinator			Ankle				
Triceps			Dorsal-plantar				

7. Sensory:

	<u>Present</u>	<u>Absent</u>
Sharp vs. dull		
Proprioception		
Pinprick		

ORAL CONSENT FORM

PARALYTIC POLIOMYELITIS STUDY

We are conducting a survey to try to determine the causes of lameness in the villages. We will ask a list of questions that will take 10 minutes to complete, and we will perform a brief physical examination that will take 15 minutes. There will be no discomfort with the examination. All information obtained will be kept in a locked filing cabinet to which only the investigators have access, and your (your child's) name will not be used in any evaluation of the information.

If your (your child's) lameness can be aided, we will refer you to the appropriate facility. Although most causes of lameness cannot be cured, the information you help provide may lead to programs that will help keep other children from acquiring lameness.

Your cooperation would be greatly appreciated.

ভৌমিক অক্ষতি বন্ধ

চোলিও রোগজনিত পক্ষাঘাতের পরীক্ষা

আমরা প্রাথমিক পক্ষাঘাতের কারণ খুঁজে বের করার চেষ্টায় একটা নিরীক্ষা পরিচালনা করছি। আমরা আশঙ্কিত কয়েকটা প্রকৃত চিকিৎসা করব এবং পরে প্রকৃতই কারিগরিক পরীক্ষা করব। এতে আমরা জানাব মোট ২৫ মিনিট। কারিগরিক পরীক্ষায় আশঙ্কিত কোন অধুবিদ্য ২৫ বেনা। অধু তথ্যাদি অশুভ হোলে মোটর আলম্বাধিতে বা থা ২৫ এক একমাত্র পরীক্ষক নিরীক্ষক ছাড়া আর কেউ তা দেখবেনা এক আশঙ্কিত অথবা আশঙ্কিত কিছু নাহা কখনও তথ্যনির্নয়কালে ব্যবহার করা ২৫ বেনা।

যদি আশঙ্কিত (আশঙ্কিত-কিছু) নষ্টকে সাধ্য করা যায়- তা হলে আমরা তার জন্য যথাযথ ধর্মবিশ্বাস-ব্যবস্থা করব। যদিও প্রায় সবক্ষেত্রেই পক্ষাঘাতের কোন চিকিৎসা নাই - শুধু আশঙ্কিত-কাছ থেকে পাওয়া তথ্যাদি ওবিধাত অন্যান্য কিছু যেন এ বিষয়ে- পক্ষাঘাত অথবা পক্ষাঘাত হুজাত না হয় - সে বিষয়ে কর্মসূচী প্রনয়ন সাধ্য করা হবে।

এই পরীক্ষায় আশঙ্কিত অশ্রয়শীল অশুভ প্রকৃতিজনীয় ২৫।