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BIOMEDICAL RESEARCH SUPPORT PROJECT

(386-0492)

PROJECT ASSISTANCE COMPLETION REPORT

LIST OF ACRONYMS

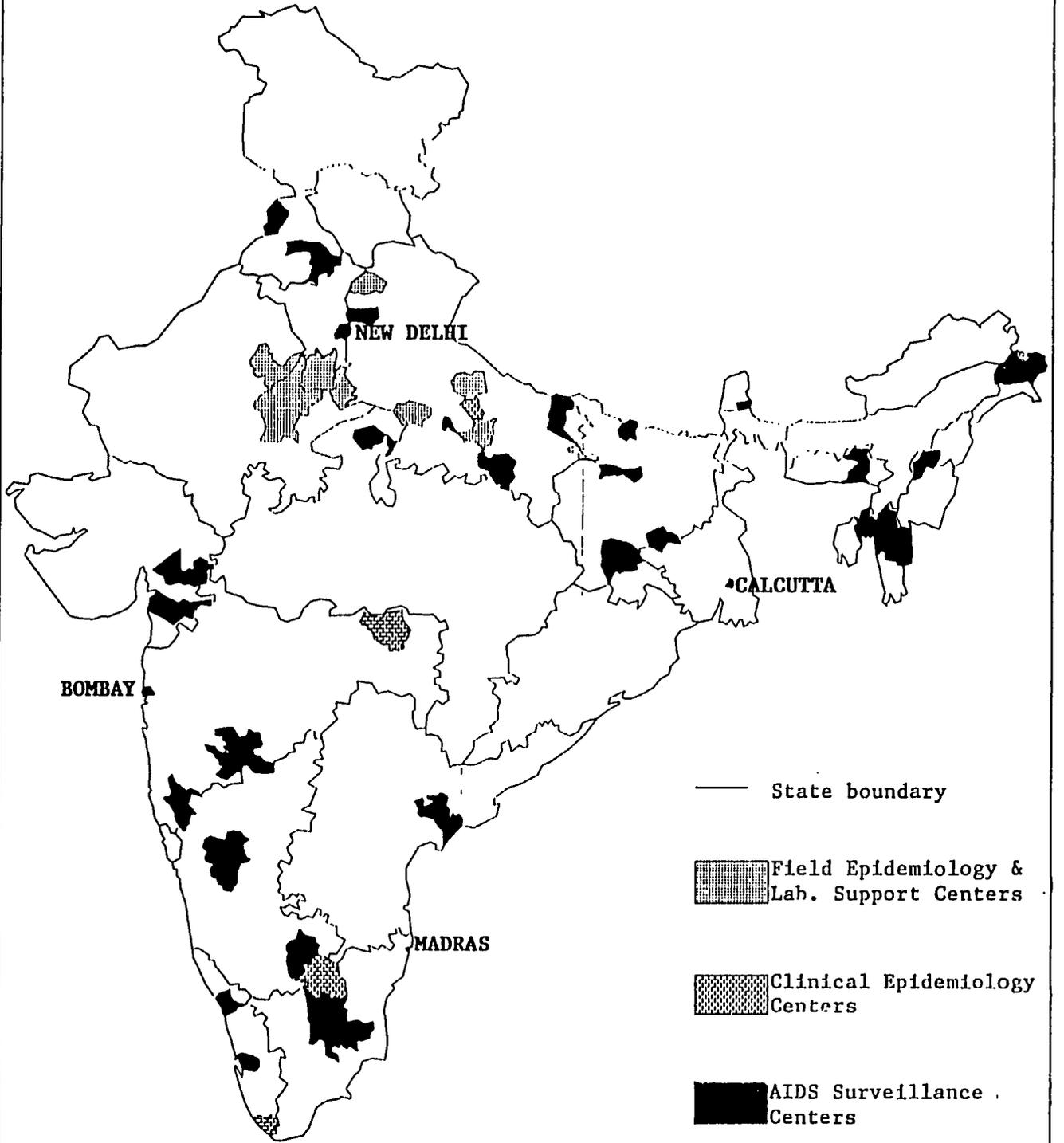
AIDS	:	Acquired Immuno Deficiency Syndrome
AIIMS	:	All India Institute of Medical Science
ASTPHLD	:	Association of State and Territorial Public Health Laboratory Directors
BRS	:	Biomedical Research Support
CBER	:	Center for Biologics Evaluation and Research
CDC	:	Centers for Disease Control
CERTC	:	Clinical Epidemiology Research and Training Centers
CEU	:	Clinical Epidemiology Unit
DDM	:	Data for Decision Making
FDA	:	Food and Drug Administration
FELS	:	Field Epidemiology and Laboratory Support
GOI	:	Government of India
HIV	:	Human Immunodeficiency Virus
INCLEN	:	International Clinical Epidemiology Network
MOEF	:	Ministry of Environment and Forests
MOHFW	:	Ministry of Health and Family Welfare
NIB	:	National Institute of Biologicals
NICD	:	National Institute of Communicable Diseases
NIH	:	National Institute of Health
OECF	:	Overseas Economic Cooperation Fund
OIH	:	Office of International Health
PACD	:	Project Assistance Completion Date
PASA	:	Participating Agency Service Agreement
PHC	:	Primary Health Center
POR	:	Program of Requirements
QCB	:	Quality Control of Biologicals
QCHT	:	Quality Control of Health Technologies
SHI	:	State Health Institute
USPHS	:	United States Public Health Service
UIP	:	Universal Immunization Program
WHO	:	World Health Organization

TABLE OF CONTENTS

	<u>Page No.</u>
1.0 INTRODUCTION	01
2.0 PROJECT GOAL AND PURPOSE	01
3.0 PROJECT HISTORY	03
4.0 PROJECT STATUS AND ACCOMPLISHMENTS	06
5.0 SUSTAINABILITY	22
6.0 LESSONS LEARNED	26
7.0 MISSION FOLLOW-UP ACTIONS	26
8.0 ATTACHMENTS	
A. COVENANTS	
B. PLANNED VERSUS ACTUAL ACCOMPLISHMENTS	
C. FIELD PROJECTS UNDER FELS TRAINING	
D. TRAINING PROVIDED BY THE MEMBERSHIP OF ASTPHLD	
E. EQUIPMENT FOR AIDS SURVEILLANCE CENTERS	
F. INTERNATIONAL CLINICAL EPIDEMIOLOGY NETWORK	
G. CLINICAL EPIDEMIOLOGY UNIT - MISSION STATEMENT	
H. CLINICAL EPIDEMIOLOGY COMPONENT - INCLLEN TRAINING LIST	
I. SUMMARY FINANCIAL STATEMENT AS OF JUNE 30, 1993	

BIOMEDICAL RESEARCH SUPPORT PROJECT

Geographical Coverage in India



1 CM : 185.70 Kms

PIN: MThomas

1.0 INTRODUCTION

The public and private health care system in India in the early 1980's was urban directed, clinically based, and curative rather than preventive in nature. As a result, it was not adequately serving seventy percent of the Indian people, i.e., those living in rural areas, and it failed to deal with rural infants and children under five years of age. It is essential to have a continuous flow of information on the diseases affecting rural populations and the relative efficacy of applied interventions. This is the province of epidemiology which involves the application of scientific methods and statistical reasoning to the problems of diseases and health care in populations. Yet despite their fundamental importance, epidemiological services were relatively non-existent in rural India. The few units which did exist were only involved in outbreak investigations and played no role in the assessment of health status, morbidity or mortality trends. The data generated at the various levels of the health system were minimally used to understand the dynamics of disease incidence, prevalence, and transmission or to set policies or define programs to address health problems. In order to improve rural health care in India by creating an epidemiological network through which relevant information could be gathered and evaluated and appropriate policy decisions made, USAID launched the Biomedical Research Support (BRS) Project in July 1985.

2.0 PROJECT GOAL AND PURPOSE

The project goal was to reduce infant and child mortality and morbidity in the labor force and to reduce fertility. The project purpose was to support a Government of India (GOI) initiative to create a functioning program of laboratory based field epidemiology with its concomitant emphasis on preventive medicine. Once established, this system would enable the GOI to gather and evaluate relevant information on the diseases affecting rural populations and to assess the relative efficacy of the interventions applied.

Five inter-related components were identified in the project paper as critical areas of activity within the Biomedical Research Support Project. They were proposed to enable the GOI to estimate the burden of illness experienced in a community; identify environmental, behavioral, and occupational health hazards; and assess the relative impact and cost-effectiveness of different mixes of resources and services in improving the health status of the population. The five components are listed below.

2.1 Field Epidemiology

The aim of this component was to develop a self-sustaining capability to train substantial numbers of field epidemiologists and support demonstration of the impact of epidemiological services by creating a fully staffed epidemiology unit in the pilot state of Maharashtra. The activity was to be executed through the National Institute

of Communicable Diseases (NICD) with assistance from the U.S. Centers for Disease Control (CDC) and the World Health Organization (WHO).

2.2 Laboratory Support Services

Under this component, a public health laboratory service was to be developed, in a top to bottom pyramid fashion. The national level would be a highly sophisticated laboratory serving as the reference laboratory to the other public health laboratories throughout India and providing applied research and testing. The state laboratories would provide most of the diagnostic testing required. The district laboratories would provide basic laboratory support. An important part of the process would be the introduction of new rapid diagnostic techniques to the public health laboratory system.

2.3 Clinical Epidemiology

The objective of this component was to establish fully functioning clinical epidemiology cells in three Indian medical colleges as national training centers and thus create a critical mass of trained clinical epidemiologists. The cells would be established with the advice and assistance of the Rockefeller Foundation's International Clinical Epidemiology Network (INCLEN).

2.4 Management Information System for Malaria

This component was designed to demonstrate the application of computer technology for epidemiological surveillance and resource management in disease control.

2.5 Quality Control of Biologicals (QCB)

This component was designed to support the constructing, equipping and staffing of a new national quality control laboratory for biologicals, including vaccines, reagents, and rapid diagnostic test kits.

The Biomedical Research Support Project supported GOI initiatives designed to encourage decentralized health planning and to create a capability in field epidemiology within the existing health services. In 1979, for example, a National Workshop on Epidemiology at the NICD recommended the establishment of a three-tiered epidemiological service (central-state-district) throughout the country as an integral part of the national health service. In addition, the workshop proposed the creation of (i) a State Epidemiological Unit, (ii) the post of State Epidemiologist, and (iii) regional, state, district, and primary health center laboratories. In 1982 and 1984, the GOI officially endorsed a policy expressing the need for a nationwide epidemiological service with complementary public health laboratory services at the state and district levels and, where required, at the primary health care level.

3.0 PROJECT HISTORY

Authorized in June 1985, the BRS Project was estimated at \$20.1 million (with an AID contribution of \$9.3 million in grant funds, \$3.8 million in loan funds and a GOI contribution of \$7 million) and was intended as a seven-year project to be completed in March 1992. Since the Project was authorized in 1985, there have been significant revisions and delays, although the original objectives and rationale remain valid. The first three years of project implementation suffered from lack of progress due to structural problems and GOI bureaucratic delays. For example, the GOI was unable to meet some of the conditions precedent and asked that the Management Information System for Malaria activity be dropped. In order to achieve the Project's objectives, USAID decided that efforts had to be streamlined, some elements dropped and others strengthened. As a result, in 1988, the Management Information System for Malaria component was dropped, and the QCB evolved into a separately funded USAID project, viz., the Quality Control of Health Technologies (QCHT) Project. However, the BRS Project retained a modified QCB component to fund QCHT pre-project activities.

In June 1990, a revised implementation plan was prepared for the Field Epidemiology and Laboratory components, which included combining them into one. (The delay in preparing the implementation plan was due to unforeseen delays in the GOI participating agencies. Changes in the personnel, especially in the appointment of the new Director of NICD, generated renewed interest in implementing the field epidemiology and lab support component of the BRS Project).

Due to the late implementation start and project restructuring, the BRS Project Assistance Completion Date (PACD) was eventually extended to August 1992. AID loan funds (\$3.8 million) and \$2 million of the AID grant funds were deobligated in 1990 and 1992 respectively. Project history, by component, is discussed below.

3.1 Field Epidemiology and Laboratory Support

In March 1986, it was proposed to implement the two components, Field Epidemiology and Laboratory Support (FELS) through a grant with the World Health Organization (WHO), and in July 1987, USAID committed grant funds to WHO for their services. During implementation the Ministry of Health and Family Welfare (MOHFW) requested that USAID restructure these components and a WHO consultant participated in the restructuring efforts. Although project implementation was slow in the FELS components for the first few years of the Project, some progress was made. From 1986-90, a basic epidemiological curriculum was defined, courses were designed to implement this curriculum in the United States, and laboratory equipment and procedures were upgraded.

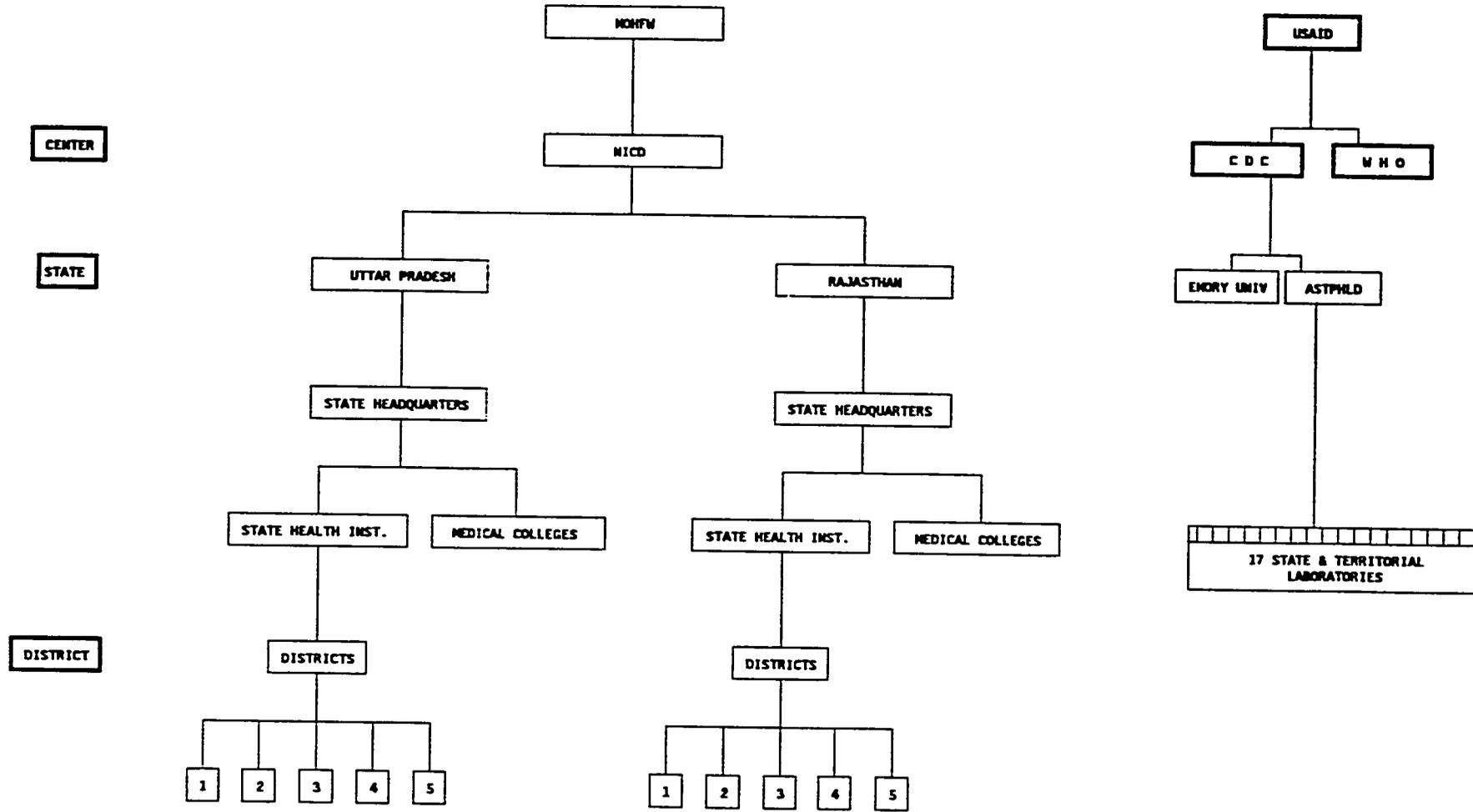
The Project acknowledges the contribution made by the WHO consultants. These experts served in India from 1987 to early 1990 and were able to develop the outlines of a core curriculum in epidemiology and to specify laboratory requirements. The component emphasized the importance of training, although the length of time and location of training were altered. The component plan called for:

- acquisition of higher level epidemiological skills by health officials and medical faculty through short-term training (6-8 weeks) in epidemiology, laboratory procedures, and health management at institutions such as the CDC;
- long-term epidemiological training (9 months) at NICD for district level health officers;
- short-term epidemiological training (6 weeks) for health personnel, and
- strengthening of NICD through the addition of qualified staff and the supply of upgraded equipment and reagents;
- short-term training (6 weeks) for laboratory personnel;
- strengthening of district, state, and medical college laboratories through the supply of upgraded equipment and reagents.

In the project paper the outputs for the field epidemiology component are specified as follows:

- the development of a critical mass of well-trained epidemiologists capable of developing, understanding and using surveillance systems, outbreak control, program implementation, and decision-making, as well as teaching methods of epidemiology to all levels of the health system;
- the establishment of an effective, fully functioning Division of Epidemiology at NICD; and
- the implementation of a "pilot" demonstration state with fully staffed and operating epidemiological services, and the conduct of field training in three states, including the pilot state, for an additional 40 field epidemiologists per year, with the potential of further expansion of the training activities to additional states.

**BIOMEDICAL RESEARCH SUPPORT PROJECT
FIELD EPIDEMIOLOGY & LABORATORY SUPPORT**



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3.1.1 Revised Plans

On June 1, 1990 as a result of the enthusiastic endorsement of NICD's new director and the effective support and cooperation of the Joint Secretary (MOHFW), the GOI endorsed the revised implementation plans prepared by USAID consultants and approved an investment in the Eighth Five Year Plan of Rs.93.079 million (US \$5.4 million at an exchange rate of \$1 = Rs.17.30) of which USAID was asked to provide approximately Rs.45.712 million (US \$2.6 million). While the objectives remained the same, the revised approach improved on the original plan, emphasizing the importance of conducting training in epidemiology and laboratory support. The NICD in Delhi was identified as the nodal organization which would be strengthened to provide field training in epidemiology and advanced laboratory work. Its role was shifted from being central to being supportive of activities occurring at the state level. After the initial two years of the program, the focus of training activities shifted to the States of Uttar Pradesh and Rajasthan, which were chosen to replace the originally planned Maharashtra and Andhra Pradesh. Although Uttar Pradesh and Rajasthan were chosen to replace Maharashtra and Andhra Pradesh, the activities remained largely identical with those originally suggested. In addition, five district public health centers in each state were selected for the development of laboratory-based field epidemiology services. The state medical colleges at Lucknow and Jaipur were to be strengthened to act as referral centers for advanced investigations (See Illustration 1).

USAID requested the CDC to provide technical assistance and training in the implementation of this component. In September 1990, senior health officials of the GOI and the states of Uttar Pradesh and Rajasthan, and a core group of trainers from the NICD and the two state medical colleges, visited CDC and other institutions in the United States for three weeks to draw up complete plans for project training activities.

3.2 Clinical Epidemiology

This component was successfully implemented early in the Project, and in October 1990, USAID increased the scope of the component by increasing the number of medical colleges targeted as national training centers from three to five: They included:

- All India Institute of Medical Sciences, New Delhi
- King George Medical College, Lucknow
- Government Medical College, Nagpur
- Christian Medical College, Vellore and
- Medical College, Trivandrum.

It was envisioned that clinical epidemiology units (CEUs) would be set up at each college through project-funded cell support and fellowship research support grants. A total of nine members in each unit would be trained under this component. They

included six clinicians, two social scientists and one biostatistician. All nine members were to be sponsored for a 12 or 16 month graduate level program at universities in Australia, Canada, or the U.S. Training began in 1987 and by March 1992, thirty-four fellows had been trained and had returned to India.

3.3 Quality Control of Biologicals

This component supported pre-project activities of the QCHT Project. Funding under this component was primarily focused on the design of a new National Institute of Biologicals (NIB) laboratory at NOIDA in Uttar Pradesh which would be established under the QCHT Project. The BRS Budget was realigned to facilitate technical assistance from the U.S. Public Health Service (USPHS), the Food and Drug Administration (FDA) and the National Institutes of Health (NIH) officials on the implementation of the QCHT Project.

4.0 PROJECT STATUS AND ACCOMPLISHMENTS

Although the BRS Project had a late start and was restructured, remarkable progress was made during the Project's last two years. Accomplishments reached approximately eighty percent of the original project objectives, and the sustainability of most project components is likely. For example the training of personnel in NICD, State Health Directorates and Medical Colleges in epidemiology ensures long-term epidemiologic and disease surveillance activities which will be supported by well-equipped laboratories and an effective data management and information processing system, both of which will continue to be funded out of respective institutional budgets after the Project's completion. This surveillance system will no doubt assist the GOI and other agencies to gather and evaluate relevant information on the diseases affecting rural populations and assess the relative efficacy of the interventions applied. Component accomplishments are discussed below and have also been provided in tabular form in Attachment B.

4.1 Field Epidemiology and Laboratory Support

The BRS Project has supported and encouraged decentralized health planning and has created a capability in laboratory-based field epidemiology within the existing health services. This was done by creating a three-tiered epidemiological service (central-state-district) in two pilot states, viz., Rajasthan and Uttar Pradesh. This was the first time such a three tiered approach was instituted and is important because of the inclusion of the district level institutions. In addition, the process for a nationwide epidemiological service with complementary laboratory services was initiated under the BRS Project. The five districts of Uttar Pradesh (Ballia, Etawah, Saharanpur, Sitapur and Rai Bareilly) and the five districts of Rajasthan (Alwar, Sikar, Tonk, Jaipur and Bharatpur) were included in the implementation of the activity, i.e., the strengthening of epidemiological services and laboratory support.

The NICD, Delhi, was the nodal agency at the national level, while the state health authorities (U.P. and Rajasthan) and K.G. Medical College, Lucknow, and S.M.S. Medical College, Jaipur, were the key agencies in the states. The events which led to the successes of the FELS component are discussed below.

4.1.1 In-country Training

4.1.1.1 Long-Term Field Epidemiology Training Course (9 months)

The first long-term field epidemiology training under the Project was conducted at NICD from November 27, 1990 to August 24, 1991. Fourteen participants (ten district level officers selected from districts of U.P. and Rajasthan and four officers from Health & Family Welfare Training Centers) attended the course. The first phase (8 weeks) of training at NICD, Delhi, was completed on January 21, 1991. The participants were trained in epidemiology and its application through skill-developing training modules prepared by NICD. In addition to classroom teaching, the participants were exposed to field exercises at Delhi and Alwar. The field exercises included identification of risk factors in poliomyelitis, with special reference to vaccine efficacy, field studies of the efficacy of measles vaccine, the prevalence of high risk factors in children under five years, general morbidity survey techniques and malariogenic stratification. Reports have been prepared and published by the participants on these exercises and are very encouraging.

At their work sites, the participants were assigned long-term activities as strengthening disease surveillance for diseases such as poliomyelitis, viral hepatitis, sera screening of pregnant women for HIV, hepatitis B, and VDRL and stool examination of acute diarrhoeal cases for V.cholerae, malariogenic stratification, and evaluation of sub-centers. They were also assigned short-term projects as shown in Attachment C to be carried out by them at their work sites based on the experience gained in the training at NICD. After carrying out these activities, the participants attended a monthly review-cum-training session alternatively at NICD and at Jaipur/Lucknow. The final phase of this training program was a three week course at NICD, Delhi.

The second session of the nine month field epidemiology training course commenced on December 17, 1991 and ended on September 16, 1992. Eight participants (five from Uttar Pradesh and three from Rajasthan) attended the course. The first phase, consisting of eight weeks of training at NICD, was completed on February 14, 1992. The participants were assigned field exercises at their work sites. The progress of these exercises was reviewed at NICD, Delhi, during 6-10 April and 15-19 June. The final phase of this training program was organized at NICD, Delhi, from August 17 to September 16, 1992.

4.1.1.2 Training for District Pathologists/Microbiologists (6 weeks)

The first course, a six week course for district pathologist/microbiologists of selected districts of U.P. and Rajasthan, was conducted from January 28 to March 12, 1991. It was attended by 14 participants. The curriculum of the course was designed to meet the needs of the district epidemiologist and in consultation with representatives of K.G. Medical College, Lucknow and S.M.S. Medical College, Jaipur. The emphasis of the training was on practical training pertaining to the field of clinical microbiology, parasitology, biochemistry and hematology. The course evaluation was positive and the participants have reported back to their districts and started activities for strengthening laboratory support.

4.1.1.3 Training for Laboratory Technicians (2 weeks)

One batch of 14 laboratory technicians from U.P. and Rajasthan were trained at NICD for a period of two weeks from January 4, 1991 to December 4, 1991.

4.1.1.4 Training for Public Health Center (PHC) Medical Officers (6 weeks)

A six-week training course of PHC medical officers of identified districts of Rajasthan and U.P. was held from February 19, 1991 to March 27, 1991 at NICD. Eighteen participants were trained. The objectives of the course were to build up the epidemiological knowledge and skill of PHC medical officers with a purpose to strengthen epidemiological surveillance and services. The participants were provided training designed to increase their skills to recognize and treat acute respiratory infection, UIP and AIDS, in addition to classroom sessions.

One course for PHC medical officers of project districts was held at S.M.S. Medical College, Jaipur, from January 6, 1992 to February 15, 1992. Sixteen medical officers were trained.

4.1.2 U.S. Training

A delegation of senior officials from Uttar Pradesh, Rajasthan, and NICD, under the leadership of Prof. G.K. Vishwakarma, Director General of Health Services, Govt. of India, visited CDC, Atlanta and other related organizations in the U.S. during September-October, 1990. Six officers spent one week and twelve officers spent three weeks in the U.S respectively. The purpose of the visit was to acquaint themselves with the Epidemiological Services and Laboratory Support Services available abroad and the role of various organizations at the National, State, and District levels; and to finalize the training curriculum and schedule.

The Director of NICD visited Atlanta, USA, in June 1992 to review project progress and discuss the follow-up activities with the officials of CDC and Emory University.

4.1.3 Technical Assistance

To accomplish the objectives outlined in the FELS component of the BRS Project, USAID obtained from CDC the following services through a Participating Agency Services Agreement (PASA):

- Technical assistance on a variety of project activities.
- Implementation of an epidemiology capacity development program through Emory University.
- Technical assistance and consultation by Association of State and Territorial Public Health Laboratory Directors (ASTPHLD).

A detailed outline of these three activities follows:

4.1.3.1 CDC provided and participated in the provision of technical assistance for the following:

- a. With the concurrence of USAID/India and NICD, CDC developed scopes of work for the appropriate consultants to provide technical assistance in curriculum review, development and improvement of field projects, establishment of surveillance systems, development of linkages between laboratory and epidemiology capacity, and other areas determined by NICD, CDC, state medical colleges involved in the project and USAID/India.
- b. With the concurrence of USAID/India, CDC provided epidemiology consultants in the following areas:
 - i. To assess the efficacy of the course materials and methods, help determine curriculum areas needing strengthening, and assist improving the course curriculum.
 - ii. For a workshop at NICD prior to the beginning of the next NICD long-term epidemiology training course.
 - iii. To train NICD Division of Epidemiology staff in the use of EpiInfo 5.01 software.

4.1.3.2 CDC and Emory University provided training, technical assistance and consultation for the epidemiology capacity development. The details are as follows:

- a. Conducted eight-week course in health care management in collaboration with CDC, focussing on health management issues in large countries with diverse population including subject matter on disaster assistance, environment analysis and patient flow analysis.
- b. Conducted one six-week course on general epidemiology and biostatistics to strengthen skills in field outbreak investigations and surveillance activities. Course included specific discussions in the areas of meningococcal meningitis, food-borne infections, hepatitis, HIV/AIDS, tuberculosis and poliomyelitis.

4.1.3.3 CDC also coordinated the following technical assistance, training and consultation provided by the ASTPHLD:

- a. Assisted in the designing and finalization of the curricula for in-country and U.S. training, designed logistical and communication systems and determined appropriate technology and methodologies that are required for the development of an effective public health laboratory system.
- b. Assisted in the equipment needs assessment.
- c. Laboratory specialists evaluated the training courses in March and August of 1992.

ASTPHLD coordinated the training for approximately twenty-four Indian laboratory scientists at appropriate sites in the United States as per the course curriculum designed for this activity. Several U.S. state and territorial laboratories participated in the implementation of the laboratory training under this Project. This training was:

Generalist Training

- Training in the U.S. for nine weeks for ten Indian scientists in the generalist category.

Specialist Training

- Training in the U.S. for eight weeks for fourteen Indian Scientists (see Attachment D) in the specialist category of:
 - Enterotoxin-Producing Organisms
 - Recombinant DNA Technology
 - AIDS
 - Fungal Diseases-Immunodiagnosis
 - Hepatitis

- Pyogenic Meningitis
- Mycotoxins & Mycotoxicoses
- Food-Borne Infections/Intoxications
- Acute Respiratory Infections
- Hybridoma Techniques
- Poliomyelitis

The U.S. consultants discussed various plans for the NICD training courses scheduled to be held beyond the BRS PACD. In addition to trainees from the two project states (U.P. and Rajasthan), several other states also sent trainees to participate in the initial two months training activities at NICD. Additionally, NICD received a request from WHO, to include in the course some epidemiologists from the neighboring countries. There were also requests from Indian medical school faculties, and from the Indian army to train some of their staff in epidemiology.

It was also suggested that NICD should continue to assume a leadership role in the national public health surveillance, promote the publication of appropriate manuscripts (developed by the trainees) in national and international journals, and organize an annual national epidemiology meeting.

4.1.3.4 Training Program and Accomplishments : A few examples

- a. Dr. Uma Chawla, Assistant Director, NICD was nominated by the Government of India for an advanced training course in Epidemiology and Biostatistics from April 15 to May 25, 1991 at Emory University, Atlanta, Georgia.

Under this training course, Dr. Chawla learnt new methodologies and analytical techniques in the field of epidemiology which were helpful in:

- i) strengthening the national level training courses being organized by the NICD; and
- ii) planning and evaluation of national health programs

On her return, using her newly acquired skills, Dr. Chawla successfully planned and initiated a multi-center study on evaluation of efficacy of measles and oral polio vaccines in eight different Indian states under the national health programs.

USAID sponsored training under the FELS component enhanced Dr. Chawla's capabilities in improving the epidemiological capabilities of NICD and in undertaking studies on national health programs.

- b. The Chief Medical Officer and the District Pathologist on their return from the U.S. after completing the FELS training made special efforts to raise funds for new laboratories at Sikar in Rajasthan state. Due to their efforts, a local charitable trust provided substantial funds for the construction of an entire floor space in a new building in the district hospital campus. Exposure to the laboratory systems in the U.S. and the professional spirit exhibited by the U.S. laboratory scientists inspired these officials to undertake this task with great enthusiasm and commitment.
- c. It was also observed that the trainees, after completing the U.S. training, have started new laboratory practices at their posts. In the state of Uttar Pradesh, the Sitapur laboratory has instituted changes to log-in procedures for specimens sent to King George Medical College, Lucknow. Plans not only to stain, but also to identify disease-causing organisms, had been instituted in two laboratories.

The trainees in general commended the training programs offered under the FELS component which increased their knowledge and experience. They have enthusiastically used their newly acquired skills for the development of laboratories, effective disease surveillance, and epidemiological work.

4.1.4 Summary of FELS Training

Persons trained in field epidemiology and laboratory support procedures are the principal outputs of the project, as follows:

- Six senior professionals of the Ministry of Health and Family Welfare of U. P. and Rajasthan have been exposed to the rationale, relevance, and impact of field epidemiology through visits to appropriate U.S. institutions, e.g., CDC - Atlanta.
- Six senior professionals, professors of social and preventive medicine at SMS Medical College and King George Medical College, attended a brief course on field epidemiology in the U.S. and visited the state health departments
- Six senior staff responsible for epidemiology training in India attended a brief course (three weeks) in planning epidemiology teaching and visited state health departments in the U.S. (three weeks).
- Ten senior staff responsible for epidemiology training in India attended an eight-week course in the U.S.
- Twelve mid-level managers attended an eight-week health management course in the U.S.

- Twenty-four microbiologists and pathologists working as laboratory instructors and technicians from NICD, the States of Uttar Pradesh and Rajasthan, and the medical colleges attended courses, approximately sixteen weeks in duration, on laboratory techniques related to generalist and specialist areas.
- Twenty-two district health officers responsible for epidemiological surveillance attended nine-month field epidemiology training program at NICD.
- Thirty-four PHC medical officers attended a six-week epidemiology course, initially at NICD and later in the states of Uttar Pradesh and Rajasthan.
- Fourteen district pathologists attended a six-week laboratory training course at NICD.
- Fourteen laboratory technicians from the states, districts and medical colleges attended a two-week laboratory technician training program at medical colleges in Uttar Pradesh and Rajasthan.

4.1.5 Increased Interaction

By project completion, the five district public health centers were established, and together with the two state medical colleges and the NICD, were functioning as a coordinated health laboratory service. A notable accomplishment under this component was the establishment of coordination between field epidemiologists and microbiologists/pathologists. Previously, these scientists had not co-ordinated their professional activities. One of the aims of restructuring and combining the two components of Field Epidemiology and Laboratory support was to ensure that both the epidemiologists and microbiologists were trained together and to instill in them the concept of joint working relationships. The five district public health centers established in Rajasthan and Uttar Pradesh ensured that those who were responsible for disease surveillance were aware of disease occurrence.

All training envisioned under this component was completed during the life of the project resulting in a cadre of epidemiologists capable of developing, understanding and using surveillance systems, as well as teaching methods of epidemiology. Through the training of scientists, technicians and public health officials at the national, state and district level, a coordinated epidemiological and laboratory service was introduced.

4.1.5.1 Linkages with U.S. Institutes

Through the training at Emory University and ASTPHLD state laboratories, important linkages between U.S. and Indian Institutions and health professionals were

established (See illustration II). In addition to training, faculty/consultants from Emory University, ASTPHLD and CDC visited India to follow up on the training and provide consulting services. ASTPHLD consultants visited India to ascertain the laboratory equipment needed by the NICD and the equipment was then procured by WHO through its agreement with USAID. By project completion, all planned laboratory equipment had been procured. This equipment was allocated by NICD to the various state and district level establishments.

Also as part of the FELS component, on USAID's recommendation, the Ministry of Health approved the use of BRS Project funds for AIDS surveillance activity and USAID provided financial support for sixty-five AIDS blood surveillance centers located throughout India. Through a grant to WHO, the BRS project facilitated the supply of AIDS surveillance kits to the blood testing centers in India (see Attachment E for list of surveillance centers).

4.1.6 Equipment

One of the objectives of BRS Project was to assist the GOI to assess and improve the quality of public health laboratories. To implement the equipment element of this component, the original Grant to WHO was utilized.

The original Grant to WHO was to support the long-term WHO consultants to coordinate the FELS activities. After the implementation plans were changed, there was no longer a need for long-term WHO consultants. Instead MOHFW requested USAID to modify the WHO grant and facilitate the procurement of equipment for public health laboratories and other surveillance centers.

4.1.6.1 Procurement for Public Health Laboratories

WHO undertook the procurement of \$560,000 worth of imported equipment agreed to by USAID and the MOHFW. The national and state level requirements for equipment needs was provided by MOHFW and USAID approved it.

On completion of the Project, specific equipment and supplies were made available to laboratories at NICD, the state health institute, King George Medical College (Lucknow), and five district hospitals in Uttar Pradesh. In Rajasthan, the laboratories of five district hospitals, the state epidemiology laboratory, and the laboratories of the departments of microbiology and social and preventive medicine at SMS Medical College (Jaipur) have been upgraded. NICD is the coordinator for receiving the equipment procured under this Project and for arranging installation at various designated laboratories in U.P. and Rajasthan. NICD is also providing the periodic supervision and training on instrumentation.

INTERACTIVE LINKAGES AND NETWORKS

*Established As a Result of
Biomedical Research Support Project*

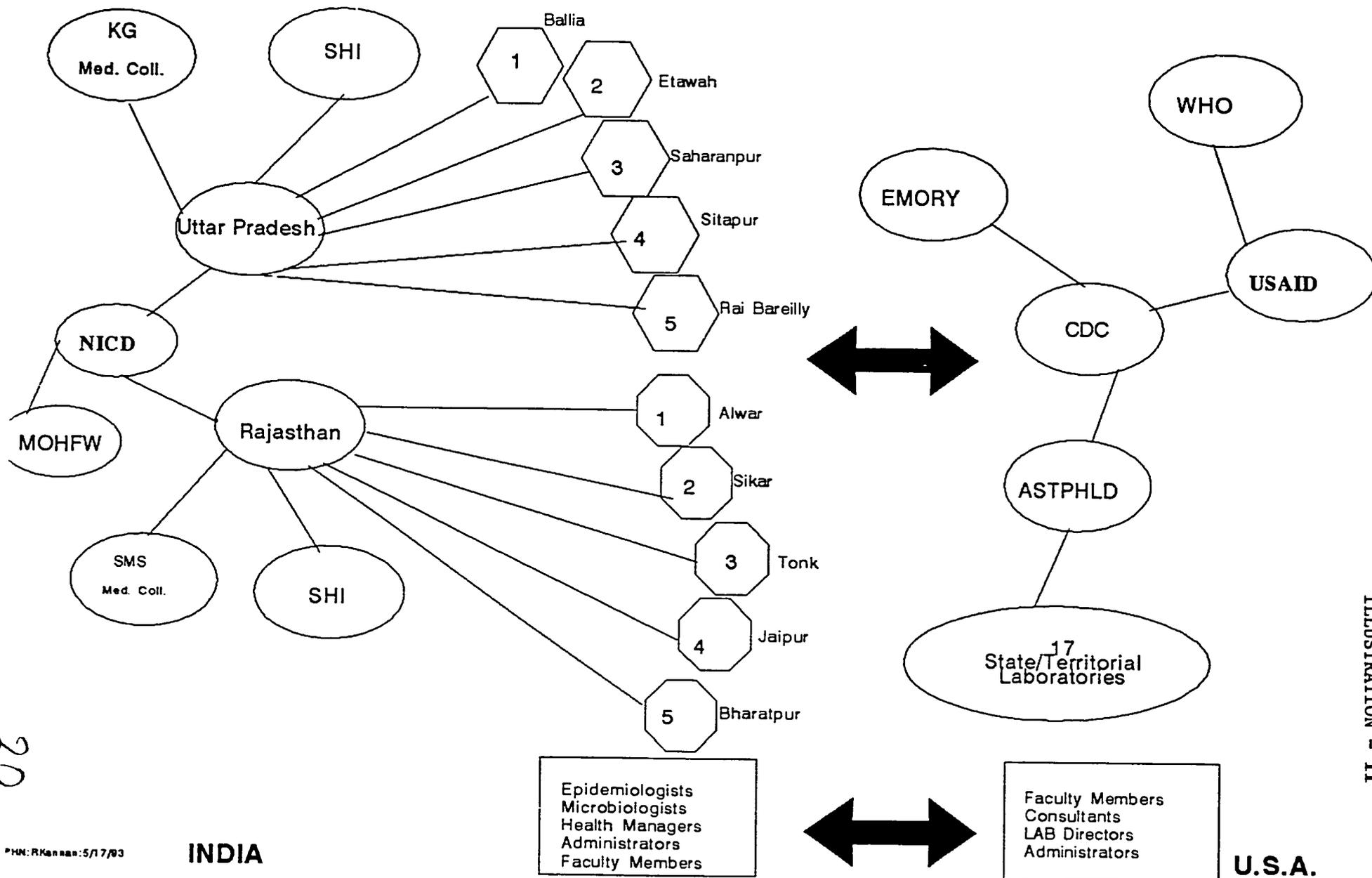


ILLUSTRATION - II

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4.1.6.2 Procurement of AIDS Equipment

As mentioned earlier, the WHO undertook the procurement, installation and commissioning of laboratory supplies totalling approximately \$1.3 million for sixty-five blood surveillance centers operating under the India Medium Term Plan for Prevention and Control of AIDS. All procurement actions were completed before the PACD of August 31, 1992 and delivered to the MOHFW's nodal agency, NICD.

4.2 Clinical Epidemiology

The purpose of this component of the BRS Project was to assist in the creation of CEUs of excellence in India as part of the International Clinical Epidemiology Network (INCLIN) Pennsylvania. Assistance was provided in the form of long-term training, research and institutional (core) support, and opportunities to exchange experience in international fora. The five medical colleges supported by this activity were:

- All India Institute of Medical Sciences, New Delhi
- King George Medical College, Lucknow
- Government Medical College, Nagpur
- Christian Medical College, Vellore
- Medical College, Trivandrum

These five medical colleges were part of the 27 medical colleges worldwide that make up the INCLIN program. Madras Medical College is also a member of the INCLIN program but is funded jointly by Rockefeller Foundation and Indian Council of Medical Research (ICMR). Participation of the Madras CEU in national meetings and workshops has been funded by USAID.

These CEUs were designated as INCLIN centers. Each CEU had one sponsor who as either the Dean or Principal of the medical college. In addition, each CEU was provided with the following staff:

- a. General clinical epidemiologists
- b. Epidemiologists with special training in Health, Economics, Social Science and Biostatistics and
- c. CEU Coordinator/Director

4.2.1 Training

The staff under (a) and (b) above were given long-term training and the coordinator/director, under (c), was given short-term training in one of the following five Clinical Epidemiological Research and Training Centers (CERTC) located in U.S., Canada and Australia as follows:

- Department of Clinical Epidemiology and Biostatistics, McMaster University, Hamilton, Ontario, Canada.
- Clinical Epidemiology Unit, University of Pennsylvania, Philadelphia, Pennsylvania, U.S.
- Center for Clinical Epidemiology and Biostatistics, The University of Newcastle, Newcastle, Australia.
- Division of Clinical Epidemiology & General Medicine, The University of North Carolina at Chapel Hill, North Carolina, U.S.
- Toronto General Hospital, University of Toronto, Toronto, Ontario, Canada.

Attachment F illustrates the INCLEN network.

These training courses were designed for the worldwide INCLEN program according to the requirements necessary for obtaining a Master's Degree at the specific university.

4.2.1.1 Evolution of Structure of Indian CEU and the Training of Personnel

Each CEU consisted of six clinicians, one social scientist, one biostatistician and one health economist. These nine CEU members were selected from among the middle level faculty members. A senior level faculty member was trained to become the director of the unit. The principal of the institution was the sponsor and the head of the unit. The persons who went on training were selected by a team of experts deputed by INCLEN, which was approved by the state and the central governments, before they were sent on training. However the university where they were sent for training had the right to reject them if their performance was found substandard and unacceptable. USAID met the cost of travel, tuition fees and living expenses. The institution had to guarantee to pay the salaries and keep them in the CEU for a minimum period of five years.

It was agreed that the CEU members would attend the INCLEN annual conferences every year and present their research materials. The expenses connected with this was met by USAID till March, 1992. Each returning fellow was given a support grant equivalent to \$5000 to start his or her research career. They had to complete a research project approved by the training institution and submit it to the university as a thesis. The CEU would be provided with an annual support grant equivalent to \$25,000 each year for a period of five years. This was to equip the center with data

processing and information system, a mini library and audio visual and other training facilities.

4.2.2 INCLLEN Meetings

4.2.2.1 Annual International Meeting

INCLLEN meetings were critical to the program and were generally held each year by the end of January at different locations throughout the world. Fellows from the worldwide INCLLEN program were expected to take part by reporting on individual and CEU activities directed toward INCLLEN goals, attending workshops and seminars and presenting scientific papers.

Indian INCLLEN fellows participated in international meetings held at Goa (India), Mexico City (Mexico), Mombasa (Kenya) and Bali (Indonesia) and presented papers on their research projects. The research efforts and the progress made by the Indian CEUs were widely praised during these meetings.

4.2.2.2 Annual Indian National Meeting (India-CLEN)

In December, 1990, the Indian CEUs formed a network called India Clinical Epidemiological Network (India-CLEN). India-CLEN, organized meetings at the national level on a rotating basis to:

- maintain the India Network and promote collaborative efforts among the CEUs.
- to present research papers for comments and discussions among their colleagues.
- to organize India-wide training programs in Clinical Epidemiology.
- to coordinate and facilitate efforts to integrate clinical epidemiology and population based research into medical curriculums in India.

The first annual India-CLEN was held in December, 1990 at Trivandrum. The second India-CLEN meeting was held in Lucknow from September 21-24, 1991. USAID provided the funds and encouragement to the CEUs for holding these meetings. All the CEUs, representatives from Rockefeller Foundation, INCLLEN, and faculty from various INCLLEN training centers attended these meetings. USAID played an active role in the formation of India-CLEN. USAID representative served on the governing body of the India-CLEN association.

Additionally, to support the training of an increased number of professionals in India in epidemiology, each of the CEUs was encouraged to develop and conduct courses with guidance from CERTC faculty. As the INCLLEN activity evolves, it is expected that training in India will take the place of international training.

4.2.2.3 Research and Core Support

Each CEU became eligible for financial support as and when two INCLLEN fellows completed their training and returned to the CEU. The CEU got a \$25,000 per year grant and each fellow got \$5,000 as research support.

4.2.3 Accomplishments

4.2.3.1 INCLLEN Training

Training of clinical epidemiology fellows started in 1987 and at project completion a total of thirty-four fellows had completed their long-term training and four fellows (CEU Directors/Coordinators) had completed their short-term training at various INCLLEN training centers in Australia, Canada and the United States (List of fellows attached in Attachment H).

4.2.3.2 Cell and Research Support

USAID/India provided the cell support and fellowship research support grants, in installments to all the CEUs beginning January, 1991. Equipment and training tools were acquired and installed by the centers. Workshops and some introductory seminars on clinical epidemiology were also conducted by some centers.

4.2.3.3 Establishment of CEUs

CEUs were established as planned at the five colleges and by project completion, a functioning INCLLEN system with over 100 members was organized in India. (Attachment F provides information on the INCLLEN network.) The CEU medical college at Trivandrum was fully staffed with all nine members trained, and the members of the other four CEUs were nearing completion of training.

In all, thirty-four of the planned forty-five CEU members had returned to India from training courses abroad. All the colleges provided space for the CEUs and the BRS Project funded the training and core unit support (computers, and related office equipment).

The CEUs have been a success and sustainable as they have established a coordinated network and have evidenced a utility to both the states and the central government. In addition, future USAID health projects will most likely call upon these facilities to

assist in analysis and research. As noted above, the CEUs have established an excellent network among themselves. Members have met annually since 1989. They have organized workshops and short courses on clinical epidemiology at some centers, and have already participated in multi-sectoral research. The scope for a national epidemiological network in India is tremendous and the reputation of the facilities has already been established. For example, the first fully staffed CEU at Trivandrum has been asked to conduct specialized research by various ministries in the GOI, such as the Ministry of Environment. (For details related to this CEU please see Attachment G.) In addition to coordination and collaboration, the BRS Project supported the CEUs participation in the international INCLLEN network, sponsoring the attendance of CEU members/staff at the INCLLEN yearly international conferences.

As part of their training, upon returning to India, the CEU members were required to conduct an individual research project. Faculty from the participating universities travelled to India to oversee research, assess the progress and assist in choosing further training candidates. The linkages which resulted from these visits were strong and are also likely to continue. Finally, a number of in-country workshops on clinical epidemiology were sponsored under this component.

Although this component was extremely successful, eleven CEU members had yet to be trained by project completion. Therefore, a concerted effort was made to enable the continuation of this component beyond the project completion date. The Rockefeller Foundation agreed to fund the training of one fellow whose training would extend beyond the termination of USAID assistance. In addition, \$2 million in grant funds was deobligated from the BRS Project and transferred to the centrally-funded Data for Decision Making Project, which will incorporate and fund the remaining training and core support activities.

4.2.4 Data for Decision Making Project

Although USAID/India's funding for INCLLEN ended on March 31, 1992, continued support for the INCLLEN program in India was provided under the Data for Decision Making (DDM) Project as described above.

The DDM Project is a six-year effort designed to develop, refine and demonstrate practical approaches to increase informed decision making for the health sector and thereby improve policies and programs. Efforts under DDM will concentrate on the human aspects of decision-making and on tools and methods to make better use of routine, available and/or poor data rather than on improving the collection of new or more data or obtaining data through more expensive studies.

The goal of the DDM Project is to make more cost-effective and efficient use of resources in the health sector of selected A.I.D.-assisted countries.

Project components include methodology identification and testing, country activities and analysis, and dissemination of evolving health issues.

4.2.5 INCLLEN Program under DDM Project

The DDM Project, through INCLLEN, proposes to continue development of a clinical epidemiology capability in India that has been initiated jointly by INCLLEN, USAID/India and the Rockefeller Foundation. Five medical schools under the BRS Project of USAID/India and one medical school supported by the Rockefeller Foundation will continue to receive support under the DDM Project.

The DDM Project, through INCLLEN, proposes to complete the training process, supervise field population-based research by the trained fellows, link the Indian institutions through a national and international network, and reinforce the process of translating this population-based research capability into data for decision makers at the local, state and national levels.

As an initial activity, the Project will support a continuation and expansion of INCLLEN's activities in India, facilitating the training activities that will enhance health officers' and technicians' abilities to link epidemiologic data with areas of policy and programmatic concern and to expand their abilities to use economic, demographic and social data.

INCLLEN supported the third annual INDIACLEN conference in September, 1992. The CEU of All India Institute of Medical Sciences (AIIMS) hosted the meeting. Approximately 100 delegates attended the meeting and shared their experiences and discussed the possibilities of some multi-center projects involving all the CEUs in India.

4.2.6 Activities Proposed During 1992 - 1994

Some of the proposed major activities and the approximate number of fellows and institutions to be covered during April 1992-94 are given below:

<u>DESCRIPTION</u>	<u>NUMBER</u>
Long-Term Fellowships	11
Short-Term Fellowships	6
Annual INCLLEN Meetings	100 (including 40 fellows)
Faculty Site Visits	25
Core Support Grant for Two Years	5 schools
Research Support Grant to Fellows	45 fellows
Annual In-country Conferences/Workshops	6

4.3 Quality Control of Biologicals

The pre-project activities of the QCHT Project were funded under the Quality Control of Biologicals Component of the BRS Project. A PASA was executed with USPHS, to cover the implementation planning activities and to facilitate NIH team visits to the U.S. for technical discussions with FDA and NIH staff.

This component also supported an initial QCHT Project planning workshop which was held in 1991, with participants from OIH, FDA, NIH, OECF, and USAID. The BRS Project also provided funds for the appointment of a Project Coordinator, for the pre-project activities of the QCHT Project, to assist the project director of NIB in the setting up of NIB as an autonomous organization. In addition, FDA and NIH teams visited Delhi several times to provide inputs in the planning and design development of the NIB. The OIH of the U.S. Public Health Service (USPHS) coordinated the technical assistance for design activities for the NIB.

4.3.1 The NIB Team Visits to the U.S.

Under this component high level technical teams from India visited the FDA and NIH to discuss the implementation plans relating to land, construction design and management, procurement of fixed and moveable equipment, technical assistance, training, evaluation and related services for the NIB. It was most appropriate for the NIB team to visit the U.S. at that stage, as the implementation phase of various activities had been initiated. In addition, the team visited a European quality control facility to broaden their understanding of the biologics control facilities. USPHS coordinated the following:

- USPHS coordinated the preparatory work and arrangements for the NIB team's visit including travel arrangements, hotels, per diem, etc.
- Hired consultants to prepare background materials, schedule appointments, organize briefing sessions and develop implementation plans.
- Assisted in the post-visit follow up activities for various components of project implementation plans including the visit of NIH and FDA officials to India.

4.3.2 Technical Assistance

On MOHFW request, USAID arranged through the PASA with USPHS the services of two full time employees for a period of approximately twelve months to serve as coordinators and technical experts for the Project to help develop and establish the NIB.

The USPHS, which was the signatory to the PASA, entered into sub-agreements with the FDA and the NIH to reimburse them for services in connection with the hiring of the two employees (one each from FDA and NIH).

The FDA employee served as the general coordinator for the project within the USPHS, working closely with all USPHS staff who were engaged in the project. The FDA employee was organizationally located in the Center for Biologics Research and Evaluation (CBER). This employee had specialized expertise in biologics quality control, and thorough knowledge of the FDA procedures and training requirements. In addition he represented the views of senior FDA staff to USAID as necessary and appropriate.

The NIH employee was organizationally located in the Division of Engineering, NIH. He had an outstanding knowledge of engineering concerns related to biomedical research laboratories as well as specialized knowledge of engineering and construction in India. The employee was responsible for planning and coordination of the engineering aspects of the Project in close coordination with the FDA project coordinator.

Both employees worked in close cooperation with USAID and the director of the NIB and appropriate staff in India. They travelled to India frequently and were available on a continuing basis to address the needs of the Project.

NIH also provided the services of an architectural and engineering firm to develop a Program of Requirements (POR) document for the renovation of the NIB's interim facility building at Jhandewalan, Delhi. The NIB team participated in the discussion, and it provided an opportunity to the team to learn the process of laboratory design, selection of appropriate equipment for different laboratories and development of cost estimates.

5.0 SUSTAINABILITY

5.1. Field Epidemiology and Laboratory Support

This component supported the initiative of the GOI to create a capability in field epidemiology within the existing health services system with its concomitant emphasis on preventive medicine. This initiative enabled the executive health authorities at the district level in the states to make appropriate decisions for prevention and control of diseases through establishment of effective surveillance mechanisms on a continuing basis.

Under the subject component, the laboratory services at NICD, state and district levels were strengthened. These laboratories are now in a position to provide accurate quantification of diseases, assist in diagnosis of outbreaks and unrecognized illnesses,

and thus contribute to the development of an effective disease surveillance mechanism with appropriate cost effective interventions.

The NICD has the mandate to implement the program until 1995, three years beyond the PACD. The initiative started by USAID will further expand and operate on a sustainable basis at district, state and central levels. The activities in the next three years are:

- Since all the U.S training activities have been accomplished using BRS Project funds, NICD will continue to provide the in-country training to health officials/epidemiologists/laboratorians for the remaining districts of U.P and Rajasthan, other states of India and a few from the neighboring countries.
- NICD has plans to coordinate and provide technical assistance to the state and district units on a regular basis on laboratory maintenance, protocol development, disease surveillance systems and analysis etc.
- Epidemiologists and Microbiologists from the project districts will be invited to Delhi simultaneously for workshops and meetings.
- Departments of Epidemiology and Microbiology at NICD, state health institute, state medical colleges were strengthened during the course of the BRS Project. The state health institute and medical colleges in U.P and Rajasthan have started organizing workshops and other training activities. Faculty from NICD also participate in these programs.
- The linkages established between NICD, CDC, ASTPHLD, Emory University School of Public Health will be further strengthened as all these institutions and the staff are already corresponding with each other on various issues of public health importance.

From the above, it can be seen that the FELS activities established under the BRS Project, are not only sustained by the GOI but also will be further expanded to other districts in the states of Rajasthan and Uttar Pradesh. The coordinated efforts between NICD and state health institutes and medical colleges will enhance the capabilities of the public health infrastructure facilities and generate compatible surveillance data at district, state and central levels.

5.2. Clinical Epidemiology

Essential national health research envisages the building of research capabilities by each country for conducting problem based research. Country specific health

problems can only be addressed appropriately and effectively through the development of a network of institutions.

Epidemiological research is now regarded as the most effective approach to identify etiological factors including environmental, behavioral and occupational health hazards and to plan cost effective interventions for prevention, diagnosis and treatment.

The establishment of CEUs in selected medical colleges in India is a milestone in this process. The BRS Project provided the opportunity to identify and establish these CEUs in five medical colleges under the Clinical Epidemiology Component. Approximately 75 percent of the training activities and almost three installments of core support and research support grants were completed before the PACD. The remaining part of the CEU development will be accomplished through the involvement of INCLIN under the Data for Decision Making Project implemented by AID/W.

5.2.1 CEUs as Centers of Excellence

The CEUs are expected to develop as centers of excellence on the completion of the CEU staff training and establishment of data processing systems, training facilities and other institutional capabilities. The CEUs at Trivandrum and Lucknow have started making efforts to initiate some research projects with Government and non-governmental agencies, the private sector and other donor agencies.

The CEU at the Trivandrum Medical College has started functioning as a full fledged unit and is implementing research projects for a variety of agencies including central ministries such as Environment and Forests (MOEF) and Rural Development.

The MOEF has identified nineteen critically polluted areas in the country and initiated a program to analyze the health status of the people inhabiting these areas. Epidemiological information related to each of these sites is not available and MOEF recognizes the importance of such data for developing location specific pollution abatement strategies.

MOEF invited proposals from various institutions/research centers including all the CEUs sponsored by USAID under the BRS Project. The CEU at the Trivandrum medical college was one of the four institutions selected for implementing the program. MOEF selected this CEU after thoroughly screening the proposals submitted by various units and presentations made by the chief investigators. The site allotted to Trivandrum CEU is Cochin, Kerala.

It was most encouraging to note that the CEU established by USAID under the BRS Project had evolved into an important element in the national program network. This was particularly significant as the support for the clinical epidemiology activities under the BRS Project came to an end by March 31, 1992, and the CEU at Trivandrum

Medical College advanced its efforts to become sustainable. The Rs. 1,050,000 grant from MOEF inspired this unit to perform well and come up with more innovative proposals.

5.2.2 Clinical Epidemiology Research and Training Centers (CERTCs)

It is envisaged that the CEUs will transform into regional training centers and train large numbers of physicians interested in research. In order for the CEUs to become sustainable and also evolve as training centers, some CEUs have already started making efforts in this direction:

The Trivandrum CEU, proposes to start:

- (i) a one year training program in clinical epidemiology with the following objectives:
 - to train sufficient number of middle level faculty members in the four medical colleges in Kerala state, for the establishment of affiliated CEUs in those colleges and to develop manpower to impart clinical epidemiological principles to graduate and post-graduate students.
 - to have a training program with clinical epidemiology, biostatistics, health economics, social sciences, information technology and management as the major areas in the training curriculum.
 - to identify faculty members from other CEUs, CERTCs, and Institutes working on management, economic research, biostatistics and social sciences as resource persons to strengthen the training activities of the CEU.
- (ii) to conduct a short-term management course for about three months to develop administrative capabilities for the four proposed CEUs in Kerala.

The Trivandrum CEU is exploring possibilities with various funding agencies to generate support for the above programs. Kerala University has been approached for affiliation of the CEU and award of academic degrees. This is being processed.

It will be noted from the above, that the accomplishment of the CEUs is clearly a good indicator of the sustainability of these units in India and is definitely one of the successes of the USAID program in India.

5.3 Quality Control of Biologicals

The activities under the Quality Control of Biologicals component expanded in their scope during the implementation of the BRS Project and evolved into an independent project called the QCHT Project. While the purpose and goal of this component formed the basis for the QCHT Project, a few activities were retained to leverage the pre-project activities of the QCHT Project.

The linkages and working relationships established between USAID, MOHFW, NIB and USPHS will continue under the implementation of the QCHT Project. The professional collaboration between the Indian scientists/officials and the U.S. is crucial for the successful implementation of the QCHT Project. This component provided the opportunity to support the initial technical assistance, exchange visits and development of implementation plans for the QCHT Project. All these activities are currently in place and are being effectively maintained by both MOHFW and USAID.

6.0 LESSONS LEARNED

The Project had to undergo restructuring due to start up delays and shifts in the focus in some project activities. Redesign as well as merger of some components turned out to be the best option to accomplish the overall project objectives.

Start up delays and changes relating to the key personnel of the program resulted in a major impediment in the initial years of project implementation. The programmatic perceptions of some of the key host country counterparts varied from time to time and as a consequence many project activities experienced delays.

The redesign of the Project facilitated the accomplishment of most of the original objectives. There was a great degree of enthusiasm in the later years of the Project. Many project activities were implemented in parallel in relatively short periods of time. To maximize the use of project resources, bureaucratic processes were reduced very effectively towards the later stages of the Project.

The working relationship established with multi-lateral organizations like WHO for the procurement of equipment was very productive. WHO accomplished the complex assignment within the limited timeframe. WHO's credibility, in-house systems and wide network of contacts with various organizations proved to be vital in achieving the program objectives.

It would be extremely useful to sustain the association with WHO, and USAID should continue to make efforts to involve WHO, wherever appropriate, in its future endeavors.

7.0 MISSION FOLLOW-UP ACTIONS

The following Mission follow-up actions are recommended.

7.1 Field Epidemiology and Laboratory Support

- a. Maintain contacts with the agencies that participated in the Project and evaluate the accomplishments of the institutional capabilities developed as outputs of the BRS Project.

NICD has invited USAID to participate occasionally in their coordination meetings with health officials, epidemiologists and microbiologists of Rajasthan and Uttar Pradesh. Visits to some of the project districts would also provide good insights into field level performance of the units.

- b. It would be extremely productive and meaningful if USAID could involve the institutional capabilities developed under BRS Project for other USAID supported programs. Such involvement by the institutions would greatly help in establishing the program credibility and in reinforcing the implementation efforts.

The Uttar Pradesh state health officials, the state medical college and the project district health units received training and equipment support under the BRS Project. They all could play a role in the implementation of the USAID-funded Innovations in Family Planning Services (IFPS) Project in Uttar Pradesh.

- c. USAID collaboration with a multi-lateral organization such as WHO, developed during the implementation of the Project, should be continued because the interaction proved to be very and fruitful.

7.2. Clinical Epidemiology

- a. Continue to stay in touch with the CEUs established under this Project. The INCLIN program will continue in India through the AID/W-funded Data for Decision Making (DDM) Project. USAID representative should attend the annual INDIA-CLEN meetings to get an overview of the progress made by each CEU.
- b. The CEUs represent a critical mass of trained professionals and have the data processing and training facilities provided under the BRS Project. Hence, the CEUs are a tremendous resource and would be worthwhile to involve the CEUs, wherever appropriate, in other USAID-funded programs. The CEU at King George Medical College, Lucknow, and Christian Medical College, Vellore have a potential role under the IFPS Project and AIDS Prevention and Control Project, respectively.

ATTACHMENTS

ATTACHMENT - A

COVENANT

1. The cooperating country/grantee shall exercise every reasonable effort to require each person trained under the project to work in activities related to the project or in activities approved for financing under the project agreement, in India, for not less than three times the length of time of his or her training program.

Status

The Host country exercised caution to comply with this covenant and made efforts to retain the trained professionals at the project related sites.

PLANNED VERSUS ACTUAL ACHIEVEMENTS

<u>PLANNED OUTPUTS</u>	<u>INDICATOR</u>	<u>ACTUAL OUTPUTS</u>
1. An epidemiological network created in one state	Epidemiological data is being collected and analyzed in one state	Epidemiological networks created in two states Initial stages of data collection and analysis in two states
2. A self sustaining capability to train field and clinical epidemiologists	A fully functioning division of epidemiology has been created at the National Institute for Communicable Diseases (NICD)	Epidemiology and microbiology divisions of the NICD were strengthened, and laboratories at the state and district levels were upgraded. Equipment for sixty-five AIDS surveillance centers was provided.
	Clinical Epidemiology Units (CEU) created in three medical colleges	CEUs were created at five medical colleges. A few CEUs started functioning as training centers.
3. An automated information system for malaria in one state and at the national level	Malaria data is being collected and analyzed	Component dropped on GOI recommendation
4. A national quality control laboratory for biologicals	Quality control lab has been constructed and equipped	Evolved as a separate USAID project Funded design activities and initial technical assistance as pre-project activities for QCHT Project.

FIELD PROJECTS UNDER FELS COMPONENT

PROJECT	PERIOD
1. Risk Factors in Poliomyelitis with special reference to vaccine efficacy	Dec. 1990
2. Acute respiratory infection in under five children - An observational study in Urban Jhuggi of Seelampur, Delhi	Dec. 1990
3. Prevalence of High risk children under five - A study in rural Delhi	Dec. 1990
4. Field evaluation of Measles vaccine efficacy by case-reference approach - A study in Seelampur area of Delhi	Dec. 1990
5. Morbidity survey in village Alawara, Distt. Alwar	Jan. 1991
6. Malariogenic Stratification, Distt. Alwar and substratification in PHC Malakhera area	Jan. 1991
7. Field evaluation of Measles Vaccine efficacy by case-reference approach, A study at sub-center Pindra of PHC Pindra, Varanasi, U.P.	Feb. 1991
8. Field evaluation of Measles Vaccine efficacy by case-control method. A study in PHC Nanauta and PHC Nakur of District Saharanpur	Feb. 1991

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| 9. | Field Evaluation of Measles Vaccine efficacy by case-reference approach, A study in PHC Nangaon areas of Alwar district | Feb. 1991 |
| 10. | A study of Knowledge Attitude-Belief towards AIDS among under-graduate students of Ajmer town | Feb. 1991 |
| 11. | A study of knowledge and attitude about AIDS among under-graduate students of Jaipur city | Feb. 1991 |
| 12. | An observational study on ARI in under-five years children at Laxmangarh Town of district Alwar | Feb. 1991 |
| 13. | Acute respiratory infections in sub-center Biswan town of PHC Tikra, district Sitapur | Feb. 1991 |
| 14. | An observational study of ARI in under-five years children of Sikandarpur Town, Distt. Ballia | Feb. 1991 |
| 15. | Malariogenic stratification, District Rae-Bareli | Jan-Feb.1991 |
| 16. | Malariogenic stratification of PHC Naugaon - Alwar | Jan-Feb.1991 |
| 17. | Malariogenic stratification - district Sitapur | Feb-March 1991 |
| 18. | Malariogenic stratification of PHC's of district Ballia | March 1991 |
| 19. | Vaccination coverage survey of Ajmer Town | March 1991 |
| 20. | Vaccination Coverage Evaluation, Rae-Bareli city | March 1991 |

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| 21. | Evaluation of vaccination coverage of Varanasi Urban area | March 1991 |
| 22. | Evaluation of vaccination coverage at Ballia city | March 1991 |
| 23. | Vaccination coverage evaluation - A study in Saharanpur Town | March 1991 |
| 24. | Evaluation of vaccination coverage at Sitapur city (U.P.) | April 1991 |
| 25. | Immunization Coverage Evaluation - Chomu - District Jaipur | April 1991 |
| 26. | Cholera Epidemic - Village Lukhnauti, District Saharanpur - A field study | June 1991 |
| 27. | Epidemic Investigation of Gastroenteritis cases in Sikar district | June 1991 |
| 28. | Evaluation of sub-centers of district Varanasi (U.P.) | June 1991 |
| 29. | Evaluation of diarrhoea case management at household level under control of Diarrhoeal Diseases Program in Rajasthan State | 10-15 Jan. 1992 |
| 30. | A behavioral Epidemiology Survey of Smoking in a selected community of Delhi | Jan-Feb 1992 |
| 31. | Intestinal Parasitic Infection Survey in districts Saharanpur, Sitapur, Etawah, Ballia (UP) and Jaipur (Rajasthan) | March-July 1992 |
| 32. | Natural disaster Epidemiology - Preparedness and early response - strengthening of epidemiological surveillance of epidemic-prone diseases with special reference to flood and droughts in Ballia/Bharatpur | April 1992 |

Training Provided by the Membership of ASTPHLD

The Association of State and Territorial Public Health Laboratory Directors (ASTPHLD) in a cooperative relationship with IHPO of the Centers for Disease Control facilitated the U.S. based public health laboratory training of the following 14 Specialists:

SPECIALIST TRAINING

<i>India Delegates</i>	<i>Origin</i>	<i>Training Lab</i>	<i>Area of Training</i>	<i>Dates of Training</i>
Dr. Charu Prakash	NICD/Delhi	Baltimore, MD	Hepatitis	Dec.11,'91 to Jan.24,92
Dr. Sati Pathak	RAJ/Jaipur	Albany, NY	Enterotoxin-producing organisms	" "
Mr. Mohan Bharadwaj	NICD/Delhi	Madison, WI	Acute Respiratory Infections	" "
Dr. Amita Jain	U.P/Lucknow	Madison, WI	Acute Respiratory Infections	" "
Dr. Ichhpujani	NICD/Delhi	Atlanta, GA	Pyogenic Meningitis	Jan21,92 to Mar.6,92
Dr. Shashi Khare	NICD/Delhi	Lansing, MI	Recombinant DNA Technology	" "
Dr. Asha Mathur	U.P/ Lucknow	Lansing, MI	Hybridoma Techniques	" "
Dr. Suman Rishi	RAJ/ Jaipur	Albuquerque, NM	Food Borne Infections/Intoxication	" "
Dr. S.T. Pasha	NICD/Delhi	Berkeley, CA	Hybridoma Techniques	" "
Dr. C. Rajendran	NICD/Delhi	Birmingham, AL	Mycotoxins/Fungal Diseases	Feb12,92 to Mar27,92
Dr. Chandrashekhran	NICD/Delhi	Birmingham, AL	Mycotoxins/Fungal Diseases	" "
Dr. D. Chattopadhyaya	NICD/Delhi	Baltimore, MD	Acquired Immune Deficiency Syndrome	" "
Dr. K.K. Khanna	NICD/Delhi	Albuquerque, NM	Food Borne Infections/Intoxication	" "
Dr. Vibha Sachdeva	NICD/Delhi	Albany, NY	Enterotoxin producing organisms	" "

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EQUIPMENT FOR AIDS SURVEILLANCE CENTERS

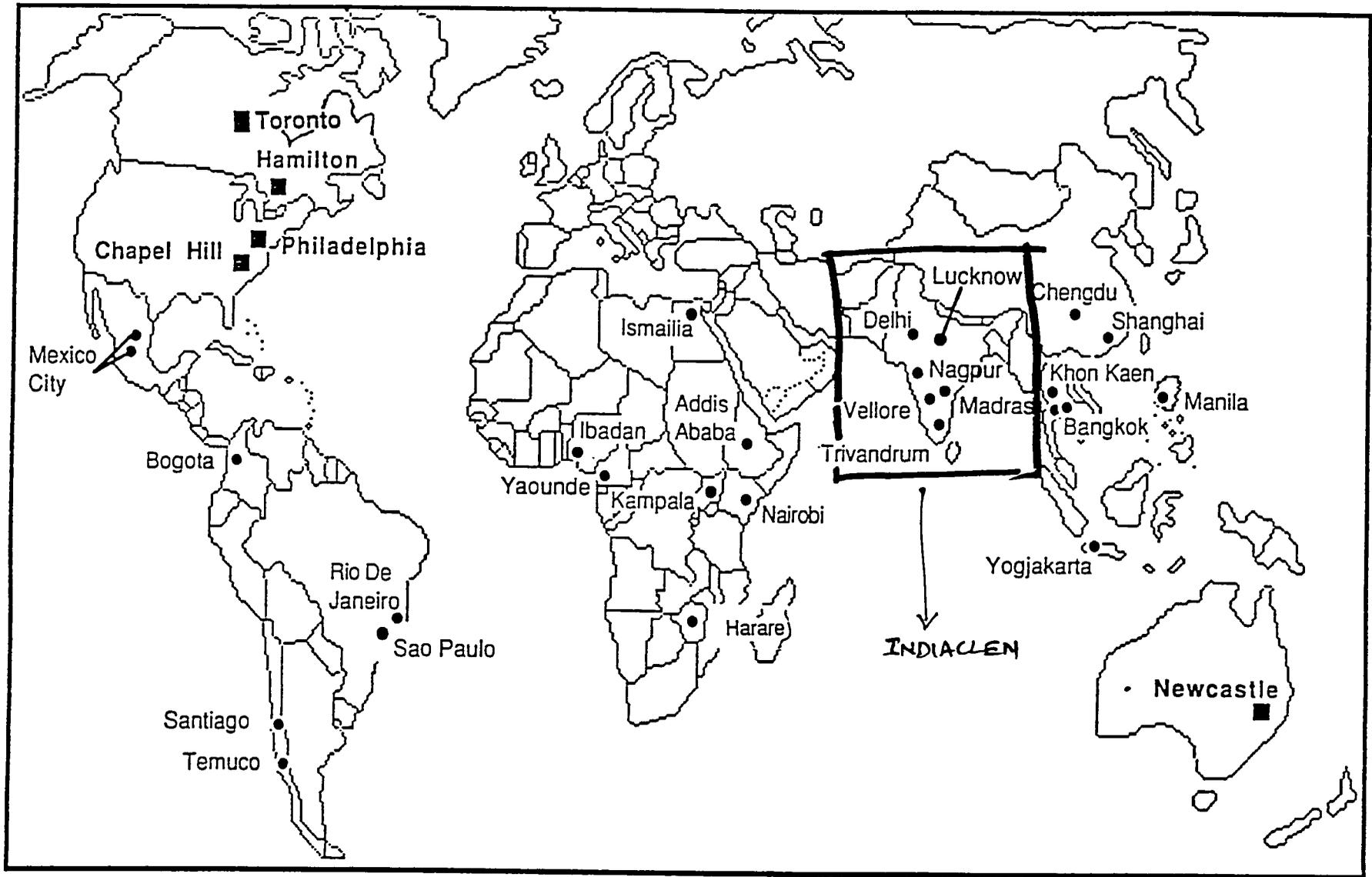
1. K.E.M. Hospital, Parel, Bombay
2. Institute of Immunohematology, Bombay
3. J.J. Hospital, Bombay
4. L.T.M.G. Hospital, Sion, Bombay
5. Nir Hospital, Bombay
6. Haffkine Institute, Bombay
7. Tata Memorial Hospital, Bombay
8. Red Cross, Bombay
9. Cooper Hospital, Bombay
10. Rajwadi Hospital, Bombay
11. General Hospital, Lalapur
12. Government Hospital, Ulhasnagar
13. Surat Medical College, Surat
14. Government Medical College, Vadodara
15. Blood Bank, Medical College, Gwalior
16. Central Blood Bank, Calcutta

17. Department of Virology, School of Tropical Medicine, Calcutta
18. Blood Bank (CNMCH)
19. Blood Bank (NRS MCH)
20. Blood Bank (AG KAR, MCH)
21. Blood Bank (S.S.KM)
22. National Institute of Cholera and Other Enteric diseases
23. Pastve Institute, Shillong
24. S.T.N.M. Hospital, Gangtok, Sikkim
25. G.B.Hospital, Agartala
26. Government Hospital, Kohima, Nagaland
27. Government Hospital, Itanagar
28. Government Hospital, Aizawl
29. Madras Medical College, Madras
30. Stanley Medical College, Madras
31. Kilpauk Medical College, Madras
32. Government Royapattah Hospital, Madras
33. King Institute, Madras
34. Gandhi Hospital, Hyderabad
35. M.J. Canoor Hospital, Hyderabad
36. Nijam's Orth. Hospital, Hyderabad
37. Institute of Preventive Medicine, Hyderabad
38. Government Headquarter Hospital, Vijayawada

39. Government Hospital, Ulhasnagar
40. Government Hospital, Salem
41. Government Hospital, Tiruchirapalli
42. Medical College Hospital, Calicut
43. Government Hospital, Ernakulam
44. H.S.I.S. Hospital, Bangalore
45. K.C. General Hospital, Bangalore
46. K.M. Institute of Oncology, Bangalore
47. K.M.C. Hospital, Hubli
48. Guru Teg Bahadur Hospital, Shahdara, Delhi
49. All India Institute of Medical Sciences, Delhi
50. Safdarjang Hospital, Delhi
51. Maulana Azad Medical College, Delhi
52. National Institute of Communicable Diseases, Delhi
53. Indian Red Cross Society, Delhi
54. Narendra Medical College, Patna
55. Patna Medical College, Patna
56. District Hospital, Dhanbad
57. Tata Hospital, Jamshedpur
58. Rajendra Memorial, Ranchi
59. Shri G.T.B. Hospital, Amritsar
60. Rajendra Hospital, Patiala

61. Civil Hospital, Ludhiana
62. Gorakhpur District Hospital, Gorakhpur
63. G.S.V. Medical College, Kanpur
64. District Hospital, Allahabad
65. District Hospital, Meerut

International Clinical Epidemiology Network



- Clinical Epidemiology Units
- Clinical Epidemiology Resource and Training Centers

45

CLINICAL EPIDEMIOLOGY UNIT

MEDICAL COLLEGE

THIRUVANANTHAPURAM

MISSION STATEMENT

The Medical College, Thiruvananthapuram is one of the premier centres for Medical Education, Research and Health Care in the State of Kerala. The Clinical Epidemiology Unit will hence strive to improve the hospital services, the health care delivery to the public and introduce change in medical curriculum by engaging in problem based research and promoting a balance between hospital and field research. The Unit will also strive to introduce cost effective, efficient, high quality programmes within the patient services, education and research of the institution where it is situated.

To achieve the foregoing the C.E.U. will :

- Prioritise the regional and National Health Issues and channelise research into these issues.
- Undertake repeated analysis on the burden of illness to evaluate the design and measurement of ongoing health system.
- Involve in health services research in collaboration with state health services to evaluate and improve interventional programmes.
- Evolve cost effective methods to offer highest professional services to the patients.
- Encourage multidisciplinary and collaborative research between clinical and pre-clinical and basic science departments and other C.E.U's.
- Educate clinicians to use interventions of proven value by examining critically evidences and employing decision analysis with the help of the expanding frontiers of information technology.
- Develop teaching modules for graduate and postgraduate students in critical appraisal of the effectiveness and efficacy of health care.
- Foster innovative approaches among graduate and post graduate students to develop new tools and techniques to offer more effective, simple therapeutic practices.
- Offer research consultancy, data processing and information search facilities to students, staff of Medical Colleges and Health Administrators.
- Develop a dialogue with Administrators, Planners and Policy makers and help them in their respective branches by offering information and consultancy.
- Encourage faculty to behave as 'leaders' and 'role models' in the field of academic, research and patient care.
- Finally to help usher in a new era by producing a new generation of Medical Graduates by influencing changes in curriculum, clinical practice and health policy.



CLINICAL EPIDEMIOLOGY UNIT



MEDICAL COLLEGE TRIVANDRUM

ANNUAL REPORT FOR 1992.

The Institution

1. Medical College, Trivandrum. Established 1950
2. University affiliation Kerala University
3. Owned and managed by Government of Kerala
4. Institution under the Medical College
 - 4.1 Medical College
 - 4.2 Dental College
 - 4.3 College of Pharmaceuticals
 - 4.4 Nursing College
 - 4.5 Institute of Paramedical Sciences
5. Collegiate Hospitals 4 Beds 2317
6. Teaching Programme offered
 - 6.1 Graduate course in Medicine
 - 6.2 Postgraduate Degree and Diploma in Medicine and Allied Specialities
 - 6.3 Superspeciality Degree
 - 6.4 Dental graduate and Postgraduate Degree
 - 6.5 Nursing graduate and Postgraduate Degree
 - 6.6 Pharmacy graduate and Postgraduate Degree
 - 6.7 Various Paramedical Diploma and Degree
7. Total Yearly Intake of students 763
8. College Library
 - 8.1 Books
 - 8.2 Bound Volumes
 - 8.3 Department Libraries 100 books each

Clinical Epidemiology Unit

Location: This C.E.U was formally inaugurated on 12 August 1992 by the Hon: Minister for Health and Family Welfare in a function at the College Auditorium. The Director of Medical Education, Director, Centre for Development Studies, Member of Legislature Assembly of this area and Dr.K.Sudhakar of USAID were present along with members of faculty, Postgraduate students, graduate students of this institution and invited guests were present.

Telephone: 91-471-44-8825.

Fax: 91-471-44-8825

Sponsor: Dr.M.A.Aleykutty, M.D - Dean - Phone OFFL: 91-471-44-3095
Res: 91-471-63-498



CLINICAL EPIDEMIOLOGY UNIT

MEDICAL COLLEGE TRIVANDRUM

C.E.U Resources

1, Manpower:

Director: .Dr.P.RavIndran, Director and Professor of Respiratory Medicine
Telephone:Off:91-471-44-8481, Res: 91-471-44-8820.

Fellows:

- Dr.M.Narendranathan, Professor & Head,Medical Gastroenterology
- Dr.M.Joshi, Associate Professor of Respiratory Medicine
- Dr.K.Thrivickrama Shenoy, Professor of Medical Gastroenterology
- Dr.M.K.C. Nair, Assistant Professor of Child Health
- Dr.Ramdas Pisharody, Assistant Professor of Nephrology
- Dr.C.Sudheendra Ghosh, Assistant Professor of Resp:Medicine
- Dr.Mathew Koshy, Assistant Professor of Surgical Gastroenterology
- Mr. Kandamuthan.M., Associate Professor of Biostatistics
- Ms.Rema Devi, Assistant Professor of Social Sciences.

2, Time:

30% time of these persons provided by Institution.

3, C.E.U Staff:

Permanent: Mr.S.Muraleedharan Nair, M.Sc (Stat) M.Sc(Bio-Statl)

Temporary:

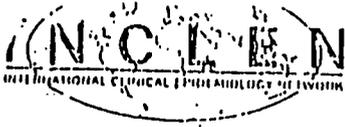
Data entry personnale	2	Parttime-Paid by CEU
Clerk cum typist	1	-do-
Messenger	1	-do-

4, Physical facilities:

- 4.1 Space - Space allotted is partitioned into:
 - i. Reception and Enquiry - 12.80 sq.mts
 - ii Data Processing & Information search Lab:35.1 sq:mts
 - iii Mini Conference room, 56.2.sq.mts
 - iv. Miscellaneous 12.6 sq. mts

Total Plinth area 116.7 sq.metres
- 4.2 Computers - 10 PCXTS and 1 PCAT386 - Siva PC of Sterling Computers.
- 4.3 Printers - Lacer Printers - HP Lacer Jet 2P - One
Dot Matrix Printers - 3 numbers
- 4.4 Soft ware
MS DOS 4.2
Lotus 1,2,3.
D'base 3 Plus
EPISTAT
EPIINFO
- 4.5 C-DRON
Provided by Institution Installed in main library
Same building as C.E.U - Ground floor.
- 4.6 Photocopier Modi Xeros
- 4.7 Fax
Caunon 250
- 4.8 Electronic Typewriter - Godrej - One

48



CLINICAL EPIDEMIOLOGY UNIT



- 3 -

- 4,9 Projection Facilities - Slide Projector, Overhead Projector, Hanging screen facilities.
4.10 Miscellaneous - Furnitures, shelves, library cabinets, computer furnitures, Hanging screen, Write and wipe board Refrigerator.

5. Library.

A. Mini Library - The following books on Clinical Epidemiology are available.

1. Clinical Epidemiology - the essentials - Fletcher
2. Designing Clinical Research - Halley
3. Clinical Epidemiology - Sachet
4. Modern Epidemiology - Rothman
5. Epidemiological Research - Kleinbaum
6. Medical Decision making - Sox
7. Epidemiology In Medicine - Henneken
8. Mini Library Resources and Training Manual 1991 - INCLIN
9. Effective care in Pregnancy and Child Health - Chalmers-Earlen-Kelrs
10. Health Research -Essentials link to quality in development commission in Health research and Development W.H.O
11. Rural Health Statistics in India

- β. Journals: 1. Journal of Clinical Epidemiology
2. Science reports - Comparative studies -Gross National summaries.

Activities in 1992.

1. C.E.U Update lectures - Once a month.
 - 1.1 Rapid Epidemiological Assessment - Dr.K.T. Shenoy
 - 1.2 Quality of Health Care - Assessment and Assurance -Dr.C.S.Ghosh
 - 1.3 Qualitative Techniques in data gathering - Ms. Rema Devi
 - 1.4 Biomedical Communications - Dr. M. Joshi
 - 1.5 Confounding factors and effect modification - Dr.M.Narendranathan
2. Protocol Designing Workshops
 - 2.1 Survey for assessing the impact of pollution on health in critically polluted areas of Cochin - Dr.Ramdas & Dr.P.Ravindran
 - 2.2 Health and Morbidity pattern in a tribal area of Kerala - Dr.K.T.Shenoy and Dr.M.K.C.Nair.
 - 2.3 Assessment of house hold health care - Expenditure In Kerala - A prospective study -Dr.C.S.Ghosh,Dr.M.Joshi and Dr.P.Ravindran.
 - 2.4 Health Impact of protected water supply -Dr.M.Narendranathan and Dr.P.Ravindran.



CLINICAL EPIDEMIOLOGY UNIT



MEDICAL COLLEGE TRIVANDRUM

3. Sensitisation Seminars and Workshops:

- 3.1 Workshop to Senior Faculty to introduce concepts of multi-disciplinary research and creation of interest groups.
- 3.2 Introduction to Medical Research - Middle level Faculty of Medical College - 19 lectures covering Research Designing, Biostatistics Health Economics, Social sciences and Information technology. Hands on session on personnel computers.
- 3.3 Protocol designing workshop - Freshly admitted students to Postgraduate courses in this institution.
- 3.4 National workshop - For National Neonatology Forum - 6 days of lectures cum protocol designing - group efforts. Participants presentation - Hands on session on personnel computers.

4. C.E.U Meetings

4.1 Administrative meetings	30
4.2 Research meetings	15
4.3 Update lectures for C.E.U Faculty	5
4.4 Workshops & Seminars	4
4.5 Research committee meetings	3
4.6 Protocol designing workshops	3

5. Other activities:

- 5.1 Consultancy in research, methodology and biostatistics to Post-graduate students and faculty
- 5.2 Reviewing grant applications for funding agencies and articles for journals.

6. Visitors:

- 6.1 Dr March Nichter
- 6.2 Dr. Nick Higginbotham
- 6.3 Dr.K. Sudhakar
- 6.4 Mr. Ramachandran Nair, Minister for Health and Family welfare
- 6.5 Mr. Pandalam Sudhakaran, Minister for sports and Youth welfare
- 6.6 Mr. S.Gopalakrishna Pillai I.A.S Secretary & Commissioner. Health and Family welfare
- 6.7 Dr. N.Nirmala Devi, Director of Medical Education
- 6.8 Dr. Stephen Walter
- 6.9 Number of Faculty members of other Universities who came as visitors and examiners to this institution which included some Kerala Doctors settled in U.S.

7. Research Projects in hand with C.E.U and the Fellows:

7.1 Funded Projects

C.E.U	Project	Amount In US\$	Funding Agency
1.	Survey on the effects of pollution in critically polluted areas in Cochin	35000	Ministry of Environment & Forests.

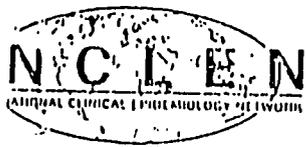


CLINICAL EPIDEMIOLOGY UNIT

- 5 -



Individual Project	Amt In US\$	Funding Agency
1. Risk factors of Carcinoma Pancreas	5000	USAID
2. Homeiliary management of pulmonary tuberculosis by short course chemotherapy	5000	-do-
3. Continuous renal replacement therapy in acute renal failure	7500	-do-
4. Cost effectiveness of educational intervention in bronchial asthma	5000	-do-
5. Determinants of Gastric Cancer in south India	5000	-do-
6. The effect of consanguineous marriage on the disability of their children	5000	-do-
7. Social factors influencing the acquisition of antibiotics without prescription in rural Kerala state	5000	-do-
8. Study of Health effects of environmental pollution due to grasy industries	5000	-do-
9. Is coconut oil a risk factor for HD?	15400	Ministry of environment and Forest KERALA, Govt. of Kerala
10. Phyllanthus Amarus in acute viral hepatitis	5000	Science & Technology Govt. of Kerala. I.C.N.R
11. Risk Factors for Oesophageal cancer	1670	-do-
12. Study of Hepatitis C	2500	-do-
13. Risk factors For Hepatitis B in patients with cancer	2500	-do-
14. Biomedical Histological and ultra structural studies of Pancreas and liver in cassava fed animals	2500	-do-
15. Risk factors for shigella dysentary in the community	2500	Science and Technology Govt. of Kerala
16. Nimbidin or sulfasalazine in the first attacks of ulcerative colitis a double blind study	750	Ford Foundation
17. Efficiency of an indigenous drug in alcohol induced hepatic damage a multi-centric trial	1670	Science & Technology Govt. of Kerala
18. Ofloxacin in bacterial diarrhoeas	1350	Pharmaceutical Co.
19. RCT of Omeprazole Vs Famotidine in Duodenal ulcer	1500	-do-
20. Risk factors for the severity of acute viral hepatitis complicating pregnancy a nested case control study	500	-do-
21. Radiation induced gastro intestinal mucosal injury an interventional study	1330	I.C.N.R
	1300	CSIR/UGC



ICAL EPIDEMIOLOGY UNIT

- 6 -



MEDICAL COLLEGE TRIVANDRUM

Biomedical and histomorphological changes in ethanol fed rats and the effects of indigenous drugs phyllanthus amarus and Andrographis paniculata

2500

Science & Techno:
Govt. of Kerala
Pharmaceutical Co.
K.H.R.W.S

Roxatidine in duodenal ulcer
Child development project

1170

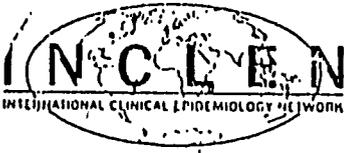
1670

Total 25 projects. Total funding \$ 1,15,810

Non Funded Projects.

- 1 Risk factors for severe disease in pulmonary tuberculosis
- 2 Mode of inheritance in bronchial asthma
- 3 Comparison of sputum cytology Vs FNAC in the diagnosis of broncho-genic carcinoma
- 4 Compliance to therapy in peptic ulcer diseases
- 5 Coffee drinking, smoking and other life styles in ulcer and non ulcer dyspepsias - a case control study
- 6 Study of ornithine aspartate in hepatic encephalopathy
- 7 Can Ketotifen prevent NSAID INDUCED gastric mucosal damage?

52



1. Interaction within Unit and with various Clinical Departments

Academic interaction within the Unit is provided by:

1. Update sessions for CEU faculty by members of CEU
2. CEU members participated in designing their CEU projects by conducting protocol designing workshops for this purpose.
3. The members meet for planning and also for administrative purposes
4. All members participated in the sensitisation workshops for middle level faculty, postgraduate students and for the National Neonatology Forum
5. The CEU has a 'matrix' organizational design and hence it runs through all the departments of the college resulting in interaction with members of the faculty of other clinical departments. The members of the faculty offers consultancy in methodology and data processing.
6. CEU conducted a workshop for the senior faculty to foster creating multidisciplinary research and succeeded in creating multidisciplinary interest groups in various fields in this institution.

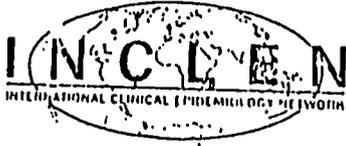
2. Influence on the Educational Programme of the Institution.

1. The CEU has its major impact so far in postgraduate education and research by postgraduates. This is reflected in their Theses. The maximum influence has been on the postgraduates of Respiratory Medicine, Gastroenterology, Child Health, General Medicine and Obstetrics and Gynaecology.
2. There is not much influence on undergraduate teaching programme so far except of giving few sensitisation lectures to them. If the Clinical Epidemiology should have some impact the subject has to be introduced into the curriculum. The curriculum is fixed by the Medical Council of India. Hence attempts should be directed to influence a change at the level of the Medical Council of India.

3. Relationships with other Medical Schools of the University.

So far there is no relationship with other medical schools. But steps are being taken to start the same as soon the training programme is launched.

Some of the CEU members have made links with other medical and non medical institutions on a 'one to one' basis. These institutions are Sreechithrathirunmal Institute of Medical Sciences, Departments of the University of Kerala, Regional Cancer Centre, Kerala Agricultural University, Keltron etc for help in their research projects.



CLINICAL EPIDEMIOLOGY UNIT

- 9 -



4. Teaching activities in Institutions other than your own

C.E.U members were invited to various institutions and association meetings to deliver C.M.E lectures. However majority of there were as experts in their original Clinical speciality. However mention should be made of the award of University grants commission lectureship to Dr. M.K.C. Nair to Government Medical College, Baroda - The subject was research methodology.

5. Interaction if any with Health Authorities

1. Gastroenterology department and the Directorate of Health Services collaborate on investigations of cases of acute diarrhoeas, enteric fever and cholera.
2. Department of Respiratory Medicine with Directorate of Health Services and Pollution Control Board collaborate in study of Health effects of Pollution in Cochin.

6. Influences, if any of your research on your countries Health Policies.

1. Child development Centre Project - 1992-93 was granted by Government. The role played by Dr. V.K.Jayapalan getting this budget should be remembered. This is mainly due to the excellent work done by Dr. M.K.C. Nair.

**CLINICAL EPIDEMIOLOGY COMPONENT
INCLIN TRAINING LIST**

Institution	Name & Title of Fellow	Place of Training	Period of Training
AIIMS, New Delhi Sponsor: Dr. S.K. Kacker Director, AIIMS	Lalit M. Nath Head of Community Med. CEU Coordinator		
	K. Srinath Reddy Asst Prof of Cardiology	McMaster University Canada	6/1/87 – 10/1/88
	J.N. Pande Prof. of Medicine	University of North Carolina, USA	8/1/88 – 7/31/89
	C.S. Pandav Asst. Prof Com. Med.	McMaster University Canada	6/1/90 – 10/31/91
	Jennifer Lobo Asst. Prof Com. Med.	University of Newcastle, Australia	2/15/91 – 12/24/91

**CLINICAL EPIDEMIOLOGY COMPONENT
INCLIN TRAINING LIST**

Institution	Name & Title of Fellow	Place of Training	Period of Training
CMC, Vellore Sponsor: Dr. Booshanam Moses Principal	Dr. A.M. Cherian Asso. Prof. of Medicine CEU Coordinator	University of Toronto Canada	4/92 – 6/92
	John Idikula Lecturer in Surgery	University of Newcastle, Australia	2/23/87 – 11/24/87
	K.R. John Reader, Comm. Medicine	University of Newcastle, Australia	3/3/89 – 12/2/89
	L. Jeyaseelan Lect. in Biostatistics	University of Newcastle, Australia	3/3/89 – 12/2/89
	Kurlen Thomas Reader in Medicine	McMaster University Canada	6/1/89 – 10/1/90
	A.K. Dayal Lecturer in Medicine	University of Pennsylvania, USA	8/21/89 – 8/20/90
	Jacob Jose Consultant Cardiologist	University of Pennsylvania, USA	Aug 1990 – Aug 1991
	Abraham Peedicayil Asst. Prof – OB/GYN	University of North Carolina, USA	8/13/91 – 3/31/92
			Funded by Rockefeller from April 1 to August 12, 1992

**CLINICAL EPIDEMIOLOGY COMPONENT
INCLN TRAINING LIST**

Institution	Name & Title of Fellow	Place of Training	Period of Training
GMC, Nagpur Sponsor: Dr. B.S. Chaubey	R.G. Salkar Asso Prof of Medicine CEU Coordinator	University of Toronto Canada	4/30/90 – 6/27/90
	A.K. Niswade Lecturer in Ped.	McMaster University Canada	6/1/87 – 10/1/88
	V.L. Gupta Lecturer in Medicine	University of North Carolina, USA	8/3/87 – 8/3/88
	P.P. Joshi Lecturer in Medicine	University of Newcastle, Australia	2/27/89 – 12/27/89
	Murtaza Akhtar Lecturer in Surgery	University of Newcastle, Australia	2/26/90 – 12/25/90
	Manorama Purwar Asso Prof – ObGyn	University of Pennsylvania, USA	08/22/90 – 08/21/91
	Archana Chowdhury Asso Prof of Medicine	McMaster University Canada	6/1/90 – 9/30/91
	Diply Jain Asso Prof – Pediatrics	McMaster University Canada	6/1/91 – 9/30/92
**** Failed ****	G.S. Jogdand Lecturer, Preventive & Social Medicine	University of Pennsylvania, USA	8/21/89 – 8/20/90

**CLINICAL EPIDEMIOLOGY COMPONENT
INCLIN TRAINING LIST**

Institution	Name & Title of Fellow	Place of Training	Period of Training
KGMC, Lucknow Sponsor: Dr. B.K.Khanna * Principal * Dr. Khanna has retired and his replacement is Dr. P.K. Mishra.	M.K. Mitra Professor of Medicine CEU Coordinator	University of Toronto, Canada	5/1/89 – 7/30/89
	R.C. Ahuja Reader in Medicine	University of Pennsylvania, USA	8/18/87 – 6/18/88
	Sushma Pandey Reader in Ob/Gyn	University of Pennsylvania, USA	8/18/87 – 6/18/88
	G.K. Singh Lect. in Orthopedics	University of Pennsylvania, USA	8/15/88 – 6/14/89
	Rajiv Nath Lect. in Ophthalmology	University of Newcastle, Australia	2/27/89 – 10/27/89
	Sandeep Kumar Lecturer in Surgery	University of Newcastle, Australia	2/26/90 – 12/25/90
	Shally Awasthi Dept. of Pediatrics	University of Pennsylvania, USA	09/01/90 – 09/30/91

**CLINICAL EPIDEMIOLOGY COMPONENT
INCLEN TRAINING LIST**

Institution	Name & Title of Fellow	Place of Training	Period of Training
<p>MC, Trivandrum</p> <p>Sponsor: Dr. M. A. Aleykutty* Principal</p> <p>Dr. V.K. Jayapalan was the previous Sponsor.</p>	P. Ravindran Prof. & Head, T.B. & Respiratory Diseases CEU Coordinator.	University of Toronto, Canada	5/2/89 – 6/29/89
	K.T. Shenoy Asst Prof, Gastroentr.	University of Newcastle, Australia	2/23/87 – 11/24/87
	M. Narendranathan Assoc Prof, Gastroentr.	University of North Carolina, USA	8/3/87 – 5/3/88
	M.K.C. Nair Asst Prof of Pediatrics	University of Newcastle, Australia	2/22/88 – 11/21/88
	M. Joshi Assoc. Prof. of TB & Respiratory Diseases	McMaster University Canada	6/1/88 – 10/1/89
	R. Pisharody Asst. Professor, Dept. of Nephrology	McMaster University Canada	6/1/88 – 10/1/89
	Sudheendra Ghosh Asst. Prof, T.B. & Respiratory Diseases	University of North Carolina, USA	8/1/89 – 12/31/90
	Mathew Koshy Asst. Prof. Dept. of Gastro Ent.	University of North Carolina, USA	08/01/90 – 07/31/91
	Rema Devi Asst. Prof – PSM	University of Newcastle, Australia	2/15/91 – 12/24/91
M. Kandamulhan Asst. Prof. – Biostatistics	McMaster University Canada	6/1/91 – 3/31/92 Funded by Rockefeller from April 1 to Sep 30, 92	

BIOMEDICAL RESEARCH SUPPORT PROJECT (386-0492)

**SUMMARY FINANCIAL STATEMENT
(US Dollars)**

ELEMENT	As of 8/31/92 OBLIGATIONS	As of 9/30/93		
		OBLIGATION	COMMITMENT	EXPENDITURE
Field Epidemiology	3,713,000	3,085,407	3,085,407	3,085,407
Laboratory Support	955,000	557,410	557,410	557,410
Clinical Epidemiology	2,230,000	2,053,553	2,053,553	2,053,553
Quality Control of Biologicals	402,000	399,365	399,365	399,365
TOTAL	7,300,000	6,095,735	6,095,735	6,095,735

Note: The Host Country Contribution has been \$2,237,278

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