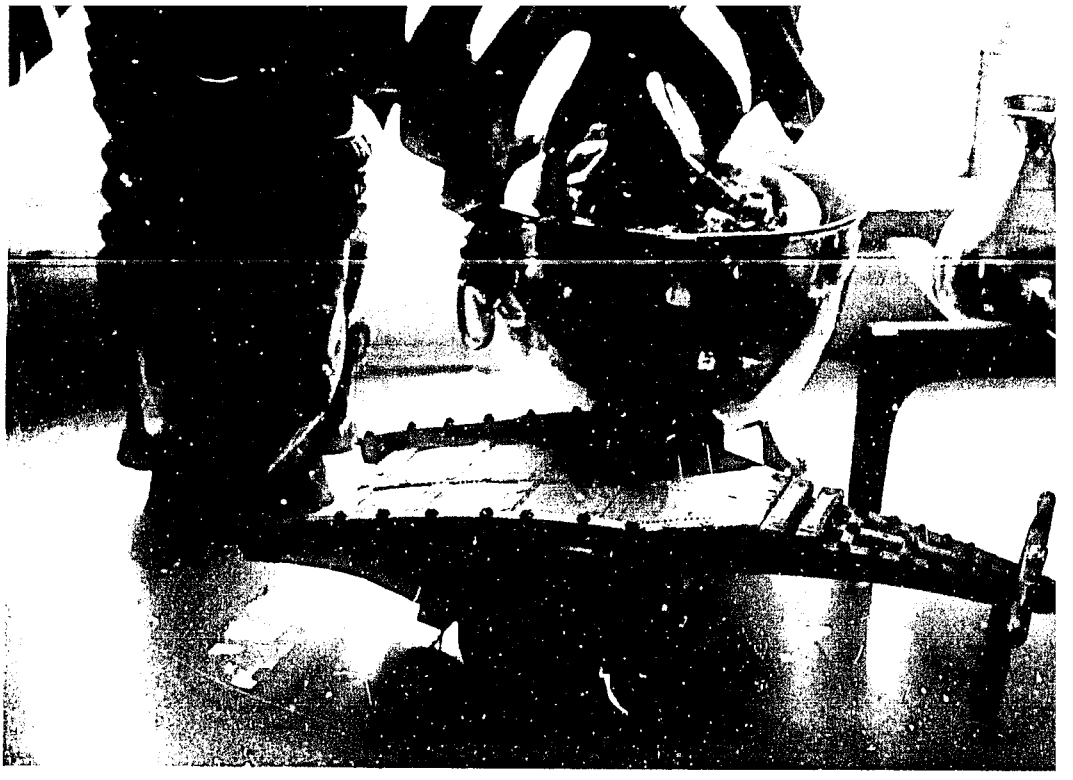
ICDDR,B

CENTRE
FOR HEALTH AND
POPULATION RESEARCH

ANNUAL REPORT

ACRONYMS AND ABBREVIATIONS

A&PD	Administration & Personnel Division
ADB	Asian Development Bank
AEEC	Animal Ethics Experimentation Committee
AIT	Asian Institute of Technology
ALRI	Acute lower respiratory tract infections
ARI	Acute respiratory infections
BADC	Belgian Administration for Development Cooperation
BDHS	Bangladesh Demographic and Health Survey
BIRDEM	Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine & Metabolic Disorders
BMA	British Medical Association
BMRC	Bangladesh Medical Research Council
BRAC	Bangladesh Rural Advancement Committee
CAP	College of American Pathologists
CARE	Cooperative for American Relief Everywhere
CDP	Community Development Project
CHD	Community Health Division
CHF	Child Health Foundation
CHP	Child Health Programme
CHW	Community Health Worker
CIDA	Canadian International Development Agency
CIS	Computer Information Services
COTC	Community Operated Treatment Centre
CRSC	Clinical Research Unit and Service Centre
CSD	Clinical Sciences Division
CWFP	Concerned Women for Family Planning
DANIDA	Danish International Development Agency
DCC	Dhaka City Corporation
DISC	Dissemination and Information Services Centre
DSS	Demographic Surveillance System
DTC	Diarrhoea Treatment Centre
ECPP	Epidemic Control Preparedness Programme
EPI	Expanded Programme on Immunization
ER&ID	External Relations & Institutional Development
ERC	Ethical Review Committee
FWA	Family Welfare Assistant
FWC	Family Welfare Centre
FWV	Family Welfare Visitor
GARNET	Global Applied Research Network
GB	Grameen Bank
GK	Gonoshasthya Kendra
GoB	Government of Bangladesh
HKI	Helen Keller International
IAEA	International Atomic Energy Agency
ICDDR,B	International Centre for Diarrhoeal Disease Research, Bangladesh
IDRC	International Development Research Centre
IEDCR	Institute of Epidemiology, Disease Control and Research
IPGMR	Institute of Post Graduate Medicine & Research
IPH	Institute of Public Health
IPHN	Institute of Public Health Nutrition
I.V.	Intravenous
JDDR	Journal of Diarrhoeal Diseases Research
JHU	Johns Hopkins University
JICA	Japan International Cooperation Agency
LSD	Laboratory Sciences Division
MCH-FP	Maternal and Child Health-Family Planning
MDIP	Meghna-Dhonagoda Irrigation Project
MH&RC	Matlab Health & Research Centre
MIS	Management Information System
MOHFW	Ministry of Health and Family Welfare
NGO	Non-governmental organization
NIH	National Institutes of Health
NIPORT	National Institute of Population Research and Training
NIPSOM	National Institute of Preventive and Social Medicine
NORAD	Norwegian Agency for International Development
NRU	Nutrition Rehabilitation Unit
ODA	Overseas Development Administration
ORS	Oral rehydration salts, oral rehydration solution
ORT	Oral rehydration therapy
OSEPP	Occupational Safety and Environmental Protection Programme
PCC	Programme Coordination Committee
PCR	Polymerase chain reaction
PDF	Project Development Fund
PHLS	Public Health Laboratory Service
PI	Principal Investigator
RISC	Research Initiative on Safe Motherhood and Child Survival
RKS	Record-keeping System
RRC	Research Review Committee
RTI	Reproductive tract infections
PSC	Population Studies Centre
SAARC	South Asian Association for Regional Cooperation
SAFE	Sanitation and Family Education
SAREC	Swedish Agency for Research Cooperation with Developing Countries
SBSP	Social and Behavioural Sciences Programme
SDC	Swiss Development Cooperation
SDTC	Satellite Diarrhoea Treatment Centre
SPSS	Statistical Package for Social Scientists
SRCS	Swiss Red Cross Societies
SRS	Sample Registration System
SWA	Staff Welfare Association
TBA	Traditional birth attendant
TCB	Training Coordination Bureau
UHEP	Urban Health Extension Project
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USS	Urban Surveillance System
WHO	World Health Organization



Asem Ansari

ANNUAL REPORT 1994

CENTRE
FOR HEALTH AND
POPULATION RESEARCH

Mission Statement

"The fundamental mission of the Centre is to develop and disseminate solutions to major health and population problems facing the world, with emphasis on simple and cost-effective methods of prevention and management."

Editor
Sarah E. Coghlan

Managing Editor
M. Shamsul Islam Khan

Desktop, Lay-out,
Printing and Publication
M.A. Rahim

Cover Design
and Graphics
Asem Ansari

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International Centre for Diarrhoeal Disease Research, Bangladesh
Mohakhali, Dhaka 1212, Bangladesh
Postal Address: GPO Box 128, Dhaka 1000, Bangladesh

Phone : (880-2)-600171-8, 600271-2
Cable : CHOLERA DHAKA
Telex : 675612 ICDD BJ
Fax : (880-2)-883116
(880-2)-886050

ICDDR,B publishes a journal, three newsletters, scientific reports, monographs, working papers, and special publications on subjects relating to diarrhoeal diseases, and population and reproductive health. Details of some of these publications may be found in this report.

PREFACE

This is the sixteenth Annual Report of the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). The report documents many aspects of the activities of the Centre during 1994, including research, support for research, health services, training, dissemination, and administration. Abbreviations and acronyms are used freely throughout the report. These are indicated on the inside of the front cover.

Scientific papers, letters, abstracts, and editorials published by the Centre's staff, members of the alumni, and by the visiting scientists are also listed. Many of these include research work actually done in previous years and documented in earlier reports.

If you have any comments on this report or would like to have more information about the Centre or the works described here, please write to the Director at the address given on the opposite page.

UNICEF Executive Director the late James P. Grant receiving the 25 Years of ORS Award from Bangladesh Prime Minister Begum Khaleda Zia

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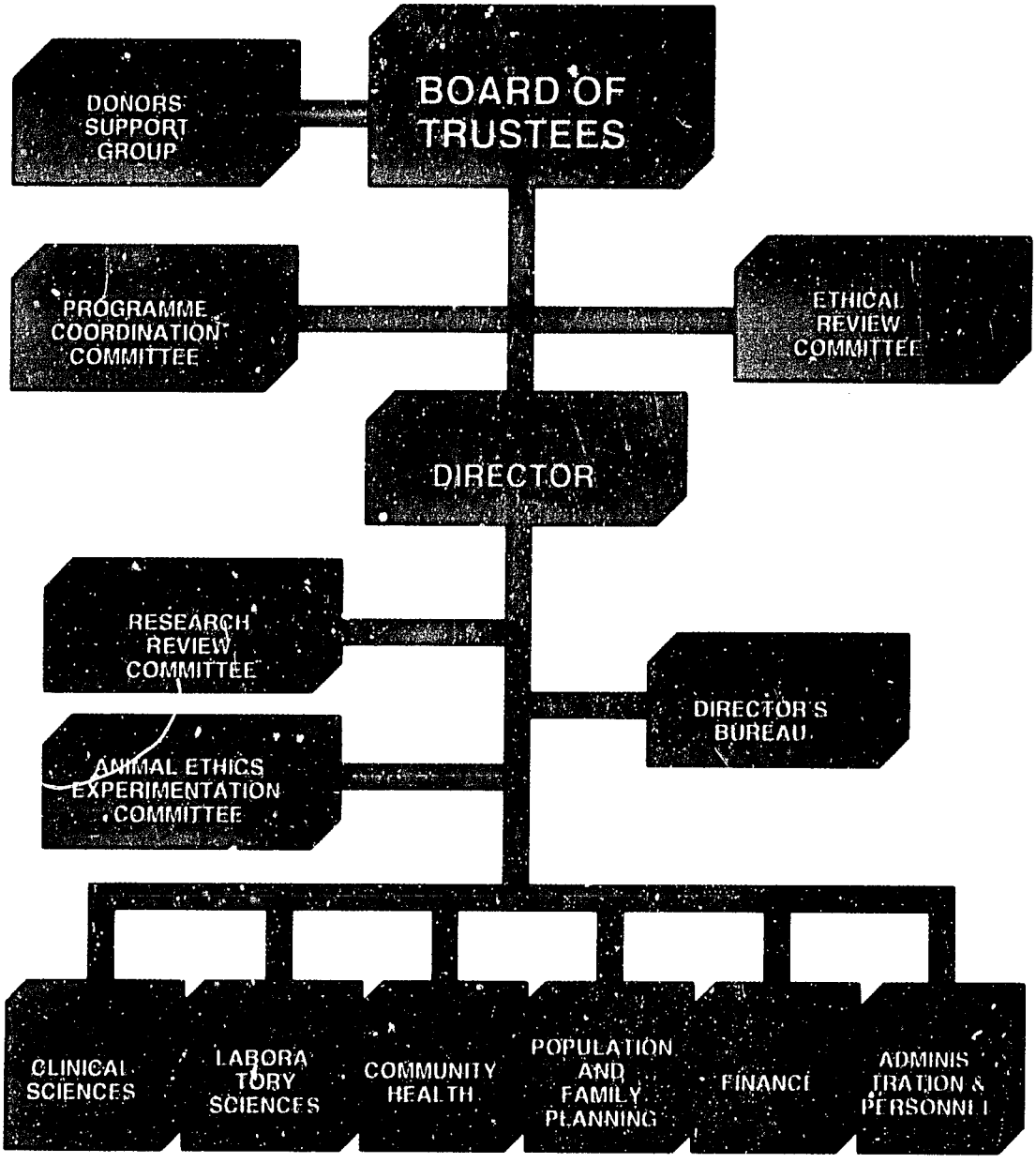


DIRECTOR'S REPORT

Celebration of the 25th Anniversary of the first successful clinical trial of oral rehydration therapy (ORT) in February, and the role played in managing the disastrous cholera epidemic amongst Rwandan refugees in Goma, Zaire in July, propelled ICDDR,B to the centre stage of global attention.

On 5 February 1994, the Prime Minister of the Government of the People's Republic of Bangladesh, the directors of the major United Nations agencies (UNDP, UNICEF, UNFPA), international health advocates and a large number of dignitaries and concerned individuals attended the celebration of the silver jubilee of the first successful clinical trial of ORT. At this function three UN agencies (UNICEF, WHO and UNDP), the Bangladesh Rural Advancement Committee (BRAC), United States Agency for International Development (USAID) and the Government of Bangladesh were presented awards in recognition of the promotion of ORT worldwide and in Bangladesh. The awards were given by the Prime Minister on behalf of ICDDR,B.

The occasion provided another opportunity to highlight the Centre's role in international health. It also reminded the world that the full potential of ORT has yet to be realized in both developing and developed countries where ORT can reduce burgeoning health care costs and avert millions of deaths in children and adults.

The truth underlying the above statement was clearly manifested when four months later a cholera outbreak claimed thousands of lives amongst Rwandan refugees fleeing to the camps in Goma, Zaire.

In response to a call for assistance, an eight-member team, including three from the Epidemic Control Preparedness Programme, two clinicians, a nurse, an environmental microbiologist, and a logistics expert, was dispatched from ICDDR,B to Goma. The team conducted epidemiological and laboratory investigations, rendered patient care and provided technical advice on case management of cholera and shigellosis to other health care providers involved in medical relief. The team found that despite the efforts of international organizations and NGOs, the mortality from cholera was much higher than expected. The team identified the slow rate of rehydration, use of inappropriate intravenous fluids, and inadequate experience of health workers in the management of severe cholera as reasons for the unacceptable death rate. The team demonstrated that case fatality can be cut to below one percent.

The Centre's Strategic Plan, "To the Year 2000", was finalized, printed and distributed to donor agencies and research institutions worldwide. It outlines an important and ambitious programme of work for the next five years that builds on the Centre's past, and maintains the focus on ICDDR,B's two pillars of excellence: diarrhoeal disease and family planning research. The new plan also emphasizes social science and health services as well as policy research as areas requiring special attention to ensure that the Centre's findings are translated into action. It is hoped the donor community, sharing the Centre's concern for the health and population problems facing the world, will join ICDDR,B in financing the implementation of this plan.

The level of research activity, as measured by the number of protocols and publications, rose to an all time high in 1994. Many of the findings are expected to have global policy implications. In the area of diarrhoeal diseases, further studies on the Bengal vibrio continued, including the development of a rapid diagnostic test; a study of reactogenicity and immunogenicity of the new killed oral enterotoxigenic *E. coli* vaccine was completed; and a clinical trial using a hypo-osmolar ORS solution showed it to be more absorption-efficient than standard ORS. A recently developed rabbit model of shigellosis is expected to facilitate vaccine development against *Shigella*.

Several completed studies on vitamin A were the basis for a one-day symposium held in December 1994. These studies spanned a wide spectrum, including evaluation of methods to determine vitamin A status, dietary strategies to improve vitamin A status, and the safety and efficacy of large-dose vitamin A supplementation in young infants and mothers. Among the findings were the demonstration that the modified relative

dose response test was not a sensitive measure of vitamin A status in malnourished children, and the consistent observation that infants receiving either 50,000 or 25,000 units of vitamin A at the EPI visits develop bulging fontanelles. It was recommended that 25,000 units of vitamin A be given at the 1st and 3rd EPI visit, at least in Bangladesh. Another finding was that adequate levels of vitamin A could be ensured in breast milk by giving a large dose (200,000 IU) of vitamin A to lactating mothers within six weeks of delivery.

Preliminary results of the effect of trans-placental transfer of antibodies to *Streptococcus pneumoniae* from immunized mothers to their newborns, and ongoing studies of the epidemiology of acute lower respiratory infections (ALRI) in two field sites, have prepared the groundwork for the Centre to launch vaccine trials against ALRI in the near future.

The International Conference on Population and Development held in Cairo in September 1994 reiterated and adopted many of the principles that have been guiding the Centre in its effort to develop effective and acceptable methods to deliver family planning programmes. The rural MCH-FP Extension Project continues with operations research activities to look into improvement of management capability, quality of care, and promoting sustainability of the national family planning programme. These efforts are expected to generate alternative service delivery approaches. The Project moved its field site from Sirajganj to Chittagong in a major bid to scale up the lessons learnt in the country's lowest performing area.

In the urban areas of Dhaka, the Centre started to work in partnership with relevant agencies of the Government of Bangladesh and NGOs, specifically Concerned Women for Family Planning (CWFP), to develop a coordinated and cost-effective MCH-FP service delivery system with emphasis on family planning. To accommodate the strengthening of the Centre's involvement in MCH-FP, an organizational change was made to bring the two MCH-FP projects together in the Population and Family Planning Division.

The Centre convened or participated in several fora to disseminate its research findings. These included the 3rd Annual Scientific Conference, which had as its theme "Environmental Health and Policy Perspectives"; a one-day vitamin A symposium; the WHO-ICDDR,B consultative meeting on ORS formulation; and the 7th Asian Conference on Diarrhoeal Diseases (which the Centre co-sponsored). In addition, several dissemination workshops were held in conjunction with the Government of Bangladesh on diverse topics, such as drug kit requirements within the government health system, lessons learned from the introduction of the doorstep delivery of injectable contraceptives, and the involvement of NGOs in water supply and sanitation programmes.

A.K. Siddique

ICDDR,B's special team in action at a treatment centre in Goma, Zaire in July 1994

Ensuring receipt of resources required by the Centre has continued to be an important activity. This work was greatly enhanced by the creation of an External Relations and Institutional Development Office with a dynamic leader. The fund-raising activities have expanded to the point where by the end of the year the Centre had two full-time staff in the United States to assist in this effort.

The above are samples of the many activities chronicled in this report. These activities testify that the Centre is indeed a vibrant and viable institution.

Demissie Habte, M.D.
Director

NINETEEN NINETY-FOUR

1994 was a year which will be remembered for the twenty-fifth anniversary of the discovery of ORS; for the role played in the cholera epidemic among the Rwandan refugees in Goma, Zaire; and for the introduction of the long-awaited Strategic Plan: "To the Year 2000."

Twenty-fifth Anniversary

Twenty-five years ago, ORS was discovered. The history of this discovery is closely aligned with that of the country in which it was born. Its success was conclusively demonstrated in 1971, when administration of ORS slashed cholera deaths from 50 to 3 percent among thousands of refugees in the War of Liberation that culminated in Bangladesh's independence.

The anniversary celebration was presided over by Begum Khaleda Zia, Prime Minister of the Government of the People's Republic of Bangladesh. She presented awards to directors of organizations involved in the promotion of this life-saving technology: BRAC, Ministry of Health and Family Welfare of the Government of Bangladesh, UNICEF, USAID and WHO. Their acceptance speeches reiterated The *Lancet*'s statement some twenty years ago that ORS is "the most important medical advance this century."

The personal involvement, and what the miracle solution meant to so many, was perhaps best expressed by Dr. J. Tulloch of the World Health Organization, who said that some of "those present or represented here could be seen as the parents of ORS, others as the relatives and friends. It is fun to take out the photograph album and to laugh or cry over the early years, but what we are really proud of today is the growth and development of our child and friend over these 25 years."

Goma: Rwandan Refugee Aid

Oral rehydration therapy could not have had a stronger confirmation than the demonstration provided among the Rwandan refugees in Goma, Zaire and the nearby Mugunga camp during July and August of 1994. A conservative estimate by the UNHCR put the death toll there at 12,000 during a three-week period. The highest daily case fatality rate among the cholera victims in the camp area had been 48%, and the overall average rate for the epidemic was about 15%.

The United States turned to Bangladesh and ICDDR,B to what USAID's director called "the most prestigious and knowledgeable organization in the world" concerning cholera and ORT. ICDDR,B responded by dispatching a group of eight experts. Specialists in clinical management and laboratory analysis of diarrhoeal diseases joined epidemic control and logistic experts to form a special team, headed by Dr. A.K.M. Siddique. This team was hurriedly dispatched to Zaire, where it remained for fifteen days.

Besides treatment, the team provided briefings and technical assistance to international relief agencies. By the time they left, they had demonstrated that even in disaster situations the case fatality rate from cholera can be brought below 1% with proper treatment. "This is a great example of the international community collaborating together for the greater good; the importance of an international centre like ICDDR,B; and how Bangladesh can make many vital contributions to the world," said the Centre's Director Professor Habte.

Changes

Changes took place over the year, and include:

- The most visual change may be the Centre's logo. The Board of Trustees approved the adding of a second descriptive line to ICDDR,B's name and logo: "Centre for Health and Population Research." This better describes the Centre and its current work and will allow and encourage the abbreviated use of "the Centre" in preference to the acronym ICDDR,B.

- The former Population Sciences and Extension Division became the Population and Family Planning Division, reflecting movement toward more effective coordination of the two MCH-FP Extension Projects (rural and urban) now under this division. The social science initiative now resides within the Community Health Division as a unit known

as the Social and Behavioural Sciences Programme.

- Two new offices have been set up as outreach locations of the Rural MCH-FP Project in Chittagong. The Urban MCH-FP Project began working with the GoB and the well-recognized NGO Concerned Women for Family Planning (CWFP). Their newly established satellite clinics provide both family planning and primary health care in one of the most poverty-ridden areas of Dhaka city.

- The Library and Publication unit, formerly the Diarrhoeal Diseases Information Services Centre, is now the Dissemination and Information Services Centre. The, acronym DISC, however, remains the same.

Child Health Foundation: Our American Cousin

In 1985 the Child Health Foundation (CHF) in Columbia, Maryland, USA was established to encourage the adoption in North America of techniques developed at the Centre (in particular ORS), and to help raise funds for the Centre and its work. CHF has 501(c)3 status and is, therefore, permitted to receive U.S. tax-free donations for the Centre.

The vision is now being realized. ORS is gaining a foothold in the USA, and in 1992 ICDDR,B entered into a new agreement with CHF to collaborate on a campaign to raise funds for the Centre, and in particular the new endowment, the "Centre Fund."

In 1994, the Centre recruited two officers Ms. Waimer Tun and Mr. Brent Berwager to operate out of the CHF office. With the help of Ms. Charlene Dale, and a highly experienced consultant, Mr. Robert Smith, formerly of the University of Maryland, the campaign is now underway. You can contact CHF on Tel: 410-992-5512 and Fax: 410-992-5641.

The Strategic Plan: "To the Year 2000"

All organizations must periodically stop, take stock, review where they have been and project where they wish to go. In 1994, ICDDR,B produced the Strategic Plan: "To the Year 2000." As the logo reflects the overall priorities of the Centre, so the inverted triangle of the Strategic Plan demonstrates visually the goals of Child Survival and Population and Reproductive Health, to be achieved through application and action policy by means of services, research, dissemination and training.

These research agenda to the year 2000 will require changes in the structure of the organization to accommodate and reflect the new direction and emphasis. It will happen slowly as the Centre evolves and as staff are recruited and trained to address the changing priorities. The Centre will increase its communication, dissemination and training efforts to influence national and international health policies in the areas of its expertise. Together, these efforts will ensure the Centre remains at the forefront of international health research to the year 2000 and beyond.

The Plan was prepared in consultation with the Centre's scientists, Board of Trustees, Donors' Support Group, government, multi-lateral and non-governmental organizations, and senior international scientists across the globe. It was completed in a series of retreats, workshops and consultative meetings over the one-and-half years before June 1994 when it was formally adopted by the Board of Trustees.

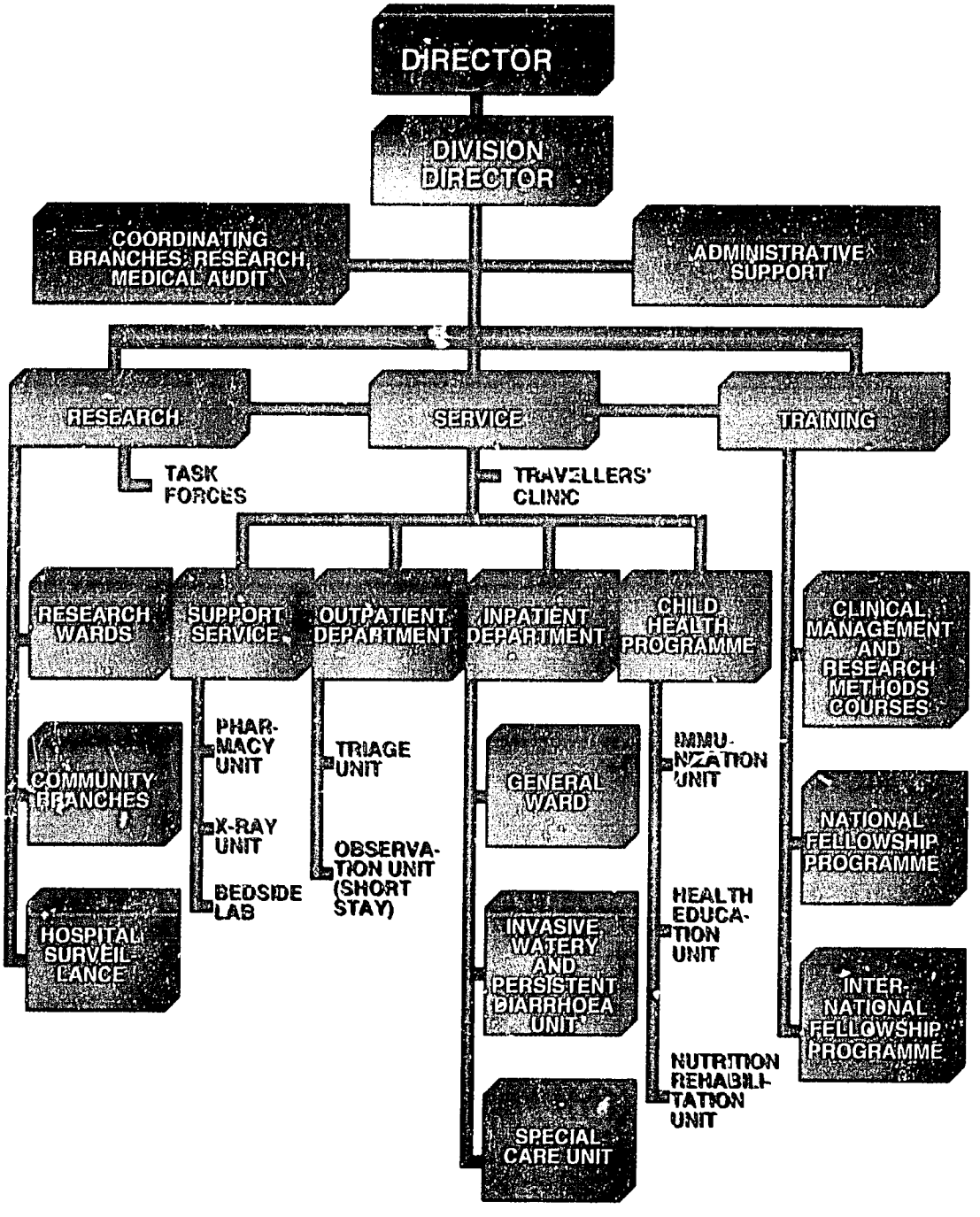
K. Akram

By providing advice to local treatment centres at Goma, the ICDDR,B team helped to dramatically lower cholera mortality rates

A BRIEF HISTORY OF ICDDR,B

1960	Pakistan-SEATO Cholera Research Laboratory established
1963	Matlab field station started First of a series of cholera vaccine trials launched
1966	Demographic Surveillance System established
1968	First successful clinical trials of Oral Rehydration Solution
1969	Relationship between stopping breast-feeding and resumption of menstruation demonstrated
1971	independence of Bangladesh
1973	Shift from Classical to El Tor cholera identified
1977	Maternal Child Health and Family Planning interventions began in Matlab
1978	Government of Bangladesh Ordinance establishing ICDDR,B signed
1981	New Dhaka hospital built Urban Volunteer Programme initiated
1982	Classical cholera returned Field testing of cereal Oral Rehydration Solution began MCH-FP Extension Project began
1983	First issue of the Journal of Diarrhoeal Diseases Research published
1984	ICDDR,B received UNICEF's Maurice Pate Award
1985	Full Expanded Programme of Immunization activities tested in Matlab WC/BS cholera vaccine trial launched
1987	ICDDR,B received USAID's "Science and Technology for Development" Award
1988	Treatment of and research on Acute Respiratory Infection began
1989	The Matlab record-keeping system, specially adapted for government use, extended to the national family planning programme
1990	The new Matlab Health and Research Centre opened
1991	ICDDR,B scientists assist in response to the diarrhoeal disease epidemics after the cyclone in southern Bangladesh, and the cholera epidemic in South America
1992	ICDDR,B-Bangladesh Rural Advancement Committee (BRAC) study commenced New Sasakawa International Training Centre built
1993	New laboratories built and equipped New *Vibrio cholerae* O139 Bengal identified and characterized
1994	ICDDR,B celebrated the 25th anniversary of the first successful clinical trial of ORS ICDDR,B team helped slash mortality in Rwandan refugee camps in Goma, Zaire

CLINICAL SCIENCES DIVISION



CLINICAL SCIENCES DIVISION

Division Director: D. Mahalanabis

Divisional Highlights

- The number of patient visits in the treatment centre was the second highest in its history.
- Intensive counselling of mothers increased exclusive breast-feeding from 4% to 62% by time of discharge from hospital. Follow-up indicated a long-term effect of counselling.
- Study characterized interaction between cytokines and complications of shigellosis.

The Clinical Sciences Division (CSD) operates a hospital in Dhaka (Clinical Research and Service Centre, CRSC), where its principal activities occur. These include: (1) clinical research, (2) care of patients with diarrhoeal disease, and (3) training. The large number of patients with all types of diarrhoea attending this hospital provide unique and extraordinary opportunities for clinical research. Many studies are performed in the hospital itself, using a 14-bed study ward and a 12-bed metabolic research ward, as well as the general wards. Others are undertaken in selected field sites within urban/periurban Dhaka.

In addition to the management of diarrhoea treatment and nutrition rehabilitation, the activities of the CRSC include health education for nearly all patients and their attendants through the Child Health Programme. The topics emphasized include: prevention and treatment of diarrhoea, immunizations, nutrition, psychosocial stimulation of children, and family planning.

The Division also operates a surveillance programme in which a 4% sub-sample of patients (every 25th patient) attending the CRSC is investigated in detail. Studies on the epidemiology of diarrhoeal diseases and the monitoring of potential changes in resistance to antibiotics are among the objectives of the surveillance programme. In 1994, the Division conducted activities with the help of 177 fixed-term staff, 90 volunteers, 34 contractual staff, 145 general service employees, and 17 trainees.

Clinical Research and Service Centre

Officer-in-Charge: M.A. Salam
Funded by: Core funds

The permanent shed constructed on the south side of the CRSC for the *Vibrio cholerae* O139 patients of the 1993 epidemic remained useful in 1994, due to the still higher number of patient visits.

A total of 114,151 patients received treatment at the Clinical Research and Service Centre in 1994, which was 25,599 (18%) less than in 1993 (139,750) and the second highest number of patients treated at the CRSC since its establishment in December 1962. *V. cholerae* O139 failed to replace the old serotype *V. cholerae* O1 as the only, or even the prevalent serotype of *V. cholerae* as hypothesized earlier. *V. cholerae* O139 was not isolated from any patients of the CRSC surveillance system during the last 4 weeks of 1994. Of the total 114,151 patients, 72,671 (64%) were discharged from the CRSC within 12 hours of their arrival compared to 65% patients in 1993.

Six thousand two hundred and sixty-one patients were admitted to the inpatient wards (General and Special Care Wards, and Research Wards) which was 570 (8%) less than in 1993 (6,831). However, admissions as a proportion of total attendance increased from 4.9% in 1993 to 5.5% in 1994. This increase most likely resulted from proportionately more severe cases being seen in the CRSC in 1994 (more uncomplicated cholera cases were seen in 1993). Of the total inpatient admissions, 5,870 (94%) were admitted to the service wards of the CRSC because of the complicated nature of the illness. This number was

304 (5%) lower than that in 1993. Those patients were hospitalized for a total of 32,923 days, or for 5.6 days on average (exactly the same as for 1993).

Of the total 6,261 patients admitted in the inpatient wards because of their complicated illness, 490 (8%) died in spite of best possible efforts. The number of deaths was 69 (12%) less than in 1993 (559 deaths). Another 17 patients died (21 in 1993) in the Observation Ward of the Outpatient Unit out of the total 107,890 patients treated in this facility, which represents a death rate of 0.016%; the figure was exactly the same as in 1993. Additionally, 74 (36 less than in 1993) patients were found dead on arrival at the CRSC. Excluding them, there have been a total of 507 deaths (490 in IPD and 17 in OPD) which is 73 (13%) less than the 580 (559 in IPD and 21 in OPD) deaths in 1993. Thus, the overall death rate in the CRSC was 0.44% in 1994 compared to 0.42% in 1993.

More than one pathogen was isolated from faecal samples of 97 (1.5%) of the patients compared to 117, or 1.7% in 1993. Faecal samples of a large number of 4,135 (66%) patients (4,447, or 65% in 1993) were either not cultured, or did not yield growth of any pathogens. Of those 4,135 patients, 7.6% died compared to 4,447 patients, and 7.7% deaths in 1993; the highest proportion of 64% (62% in 1993) deaths was observed in these patients. Enterotoxigenic *Escherichia coli* (ETEC) and rotavirus are not routinely looked for at the CRSC. However, testing for rotavirus is routinely performed in the 4% sub-sample of patients of the Surveillance System, and accounted for approximately 27% of diarrhoea in children of less than 5 years.

A total of 83,670 litres of intravenous fluid was used for the treatment of patients at the CRSC, which is 94,392 litres (53%) less than that in 1993 (corrected figure for 1993 is 178,062 litres). An average of 0.73 litre/patient of intravenous fluids was used in 1994, which is ~0.5 litre/patient less than that in 1993, which is likely to be due to less severely dehydrated cases seen in 1994. A total of 484,179 litres of ORS solution was used in 1994 compared to 611,112 litres in 1993 with average use of 4.24 litres (4.4 litres/patient in 1993). The ratio of use of intravenous to oral rehydration fluid (I.V. : Oral) was 1 : 6 in 1994 (1 : 3 in 1993).

Clinical Research

Of the total inpatient admissions, 391 (6%) were admitted in the two research wards under a total of 13 research protocols (1 protocol less than that in 1993), and the number of patients admitted into the study wards was 266, 40.5% less than that in the previous year. Average duration of hospitalization of the study patients was 5.8 days (0.8 days/patient less than that of 1993).

An additional 4,566 patients were studied under the CRSC Surveillance System, and this was 1,384 (23%) less than that in 1993. The system provides information, such as on age, sex, nutritional and socioeconomic status of the patients, epidemiology, clinical importance such as aetiology and seasonal variation in their incidence, and antimicrobial susceptibility.

Two hundred and eighty-one additional non-admitted patients were studied in the clinical study ward under 2 protocols. This number is 142 (102%) higher than that in the previous year. Another 412 patients were studied in the OPD under 4 different research protocols, which is 288 patients (41%) less than that in 1993.

X-ray Unit

Seven thousand six hundred and six X-rays were performed in 1994 (49 higher than that in 1993). These include 6,243 (82% of total) chest X-rays and 567 (8%) abdominal radiographs. Only 22 X-rays were performed on payment, including 16 chest X-rays and 6 abdominal X-rays. During 1994, a total of 338 electrocardiographs were performed (29 less than that in 1993).

Travellers' Clinic

A total of 68 patients (13 patients more than in the previous year) attended the clinic for consultation in 1994. The clinic handled a total of 2,075 (455 less than that in 1993) samples for different investigations that include 1,265 for clinical pathology, 180 for microbiological investigations,

462 for biochemical tests, and 20 for other miscellaneous tests. Five X-rays, and 75 (150 less than that in 1993) endoscopic examinations were performed in this clinic during 1994.

CRSC Coordination Committee

This committee was formed in 1993 with the objective of developing better coordination among different units and various categories of CRSC staff, monitoring quality of patient care and suggesting measures for improvement. The Committee continued to function well in 1994. The members met more frequently (weekly instead of monthly) in 1994.

Medical Units and Morning Briefing Sessions

Important events of the previous 24 hours are discussed for 25-30 minutes every morning, with physicians, nursing officers, and CRSC manager participating. The session is meant for learning, for exchange of views on clinical and administrative problems, and for dissemination of information obtained from the laboratories and the CRSC surveillance system.

Asem Ansari

A mother feeds ORS to her dehydrated child

Single-dose treatment of adults with cholera due to *V. cholerae* O139 with ciprofloxacin

PIs: W.A. Khan, M.A. Salam and M.L. Bennish
Funded by: Bayer AG, Germany

In this randomized, double-blind study, the efficacy of a single 1-g dose of ciprofloxacin was compared with a single 300-mg dose of doxycycline in the treatment of 129 adults with cholera due to *V. cholerae* O139.

The study was performed in males aged 18 to 60 years, who had watery diarrhoea of ≤ 24 hours duration, and moderate to severe dehydration, admitted to the CRSC. Fifty-nine patients were randomly assigned to ciprofloxacin and 70 to doxycycline.

The admission characteristics, such as age, body weight, duration of diarrhoea, degree of dehydration, and stool volume over a 4-hour observation period, were similar in the treatment groups. Therapy was clinically successful in 54 (91%) and 64 (91%) of the patients in the ciprofloxacin and doxycycline group respectively.

The volume of watery stools and the amount of intravenous fluid and ORS solution required by the patients in the two treatment groups were also comparable. However, treatment with ciprofloxacin was associated with a more rapid eradication of *V. cholerae* O139 from the faeces. Although ciprofloxacin resulted in more rapid eradication of the organism from the stool compared to doxycycline, no clinical advantage was observed. Because of the potential of drug resistance, the routine use of ciprofloxacin in the treatment of *V. cholerae* O139 should be discouraged.

Single-dose treatment of adults with cholera due to *V. cholerae* O1 with ciprofloxacin

PIs: W.A. Khan, M.A. Salam and M.L. Bennish
Funded by: Bayer AG, Germany

The objective of this randomized, double-blind clinical trial was to compare the efficacy of a single 1-g dose of ciprofloxacin with a single 300-mg

dose of doxycycline in the treatment of adults with cholera due to *V. cholerae* O1. A total of 130 males aged 18 to 60 years with watery diarrhoea of ≤24 hours duration and moderate to severe dehydration has been studied. Data analysis is in progress.

C-reactive protein and pre-albumin as markers of disease activity in shigellosis
PIs: W.A. Khan, M.A. Salam and M.L. Bennish
Funded by: Bayer AG, Germany

The objective of this study was to determine if serum C-reactive protein (CRP) and pre-albumin (PA) concentrations can be used as markers of disease activity in shigellosis. Serum concentrations of CRP and PA were measured at admission, and on study day 3 and 5. Serum concentrations of CRP and PA were also determined on 10 adults with acute watery diarrhoea of ≤24 hours duration due to *V. cholerae* O1 who served as the controls.

On admission, patients with shigellosis had higher admission median concentration of CRP (109 vs. 5 mg/l; $p<0.01$), and significantly lower median concentration of PA (16 vs. 23 mg/l; $p<0.01$) compared to patients with cholera. Among patients infected with *Shigella*, a significant decline in the concentrations of CRP and significant increase in the concentrations of PA were observed on study day 3 and 5 compared to their admission concentrations. An admission concentration of ≥ 110 mg/l of CRP had a 70% sensitivity and a 61% specificity in predicting treatment failure in patients with shigellosis, with a positive predictive value of 14% and a negative predictive value of 96%. In summary, acute shigellosis elicits an acute phase response, and the magnitude of the changes in CRP and PA concentrations has potential for use in predicting clinical outcome.

Yogurt-based diet: effect on persistent diarrhoea
PIs: A. Islam and D. Mahalanabis
Funded by: SDC

Persistent diarrhoea, with or without malnutrition, contributes to a substantial proportion of diarrhoea-associated deaths in young children. In order to minimize the risk of malnutrition and to improve the nutritional status of children with persistent diarrhoea, an energy-dense and assimilable diet was tested in a randomized clinical trial. Yogurt as a milk substitute was chosen because it is traditionally acceptable, and better absorbed, and has a reduced lactose content compared to fresh milk. Eighty-six partially breast-fed male infants of 5 to 23 months with diarrhoea for >14 days were randomly assigned to receive a milk-cereal (*khai* powder, popped rice used as cereal) diet (Group A) or yogurt-cereal diet (Group B). Results of the study showed a trend toward reduced stool volume in the yogurt-cereal diet group, although the difference was not significant. The energy was less, compared to Group A. Despite less intake of diet by boys of Group B, there was no significant difference in their body weight when compared with Group A during the study period. This could be possibly explained by better absorption of energy by Group B boys as evident from the metabolic absorption study performed in limited cases. We conclude that, while the yogurt-cereal diet is not superior to the milk-cereal diet, yogurt-cereal diet might be an alternative dietary therapy for management of persistent diarrhoea and prevention of malnutrition.

Amylase-rich germinated cereal (ARGC) and acute dysentery
PIs: D. Mahalanabis and M. Rahman
Funded by: SDC

To evaluate whether an energy-dense porridge liquefied by amylase-rich flour (ARF) from germinated wheat increases the calorie intake in children with acute shigellosis, a randomized controlled clinical trial was performed. Children were randomized to receive either an energy-dense porridge liquefied with ARF (Group 1), a thick unaltered porridge (Group 2), or a porridge diluted with water (Group 3). After randomization, the children were offered the study porridge four times a day for five days. In addition to study diet, milk-rice mixture or *khichuri* (rice and lentil mixture) was offered three times daily. Breast-fed children were allowed to take breast milk *ad libitum*. Preliminary analysis showed that the mean

± SD calorie intake (kcal/kg.d) from the porridges were 67±27, 40±24, and 36±19 in Group 1, 2 and 3 respectively (difference of means, 95% C.I.: a vs. b = 27, 11-43; a vs. c = 31, 17-45). The total energy intake from all sources (mean ± SD) in the 3 groups were 112 ± 36, 90 ± 29 and 84 ± 24 kcal/kg.d respectively ($p<0.005$). The intake from breast milk was similar among the three groups. The difference in intake was greater among younger than among older children. This feeding approach might be useful in preventing malnutrition associated with dysentery.

Safety and effect of vitamin A supplementation
PIs: D. Mahalanabis and M.M. Rahman
Funded by: USAID

This was a double-blind, placebo-controlled clinical trial to investigate whether monthly administration of vitamin A at routine immunization produces any undesirable side-effects, and to study the effect of this supplementation on the vitamin A status of infants. Infants aged 6-17 weeks were randomly assigned to receive either vitamin A (25,000 IU) or a placebo. One dose was given with each of the 3 EPI immunizations, which were given at monthly intervals. Infants were examined by a physician before and during the 24 hours after administration of each dose, and any signs of toxicity were recorded. Venous blood was drawn at entry and one month after the 3rd dose for retinol assay. One hundred and one infants received vitamin A and 98 received placebo. Decreased feeding, irritability, diarrhoea, and vomiting were comparable between the two groups. In the vitamin A group, five infants developed bulging fontanelle; three of them developed it once (after 1st, 2nd or 3rd dose respectively), one developed it twice (after both 2nd and 3rd dose), and another after all three doses. In the placebo group, a single child developed bulging fontanelle after the 3rd dose. In all the cases the bulging disappeared within 48 hours of onset except in one infant in whom it subsided after 60 hours. The total bulging episodes in the vitamin A and placebo groups were 8 and 1 respectively (RR=7.7; $p<0.04$). None of these infants showed irritability. At entry fasting retinol level was <10 µg/dl in 35% infants and in 87% infants it was <20 µg/dl. After the third dose, fasting retinol level was marginally better in the vitamin A group (mean ± SD: 21.9 ± 8.2 vs. 19.2 ± 7.8; $p=0.05$). However, 47% infants receiving supplementation still had serum retinol level of <20 µg/dl. These results suggest that administration of 25,000 IU of vitamin A in young infants along with routine immunization is associated with an increased incidence of transient bulging fontanelle, but without other associated adverse signs or symptoms. However, this dose schedule might still be inadequate to prevent deficiency in this population.

The role of cytokines in the pathogenesis of complications of shigellosis
PIs: M.L. Bennish, M.A. Salam and W.A. Khan
Funded by: USAID

The objective of this study was to evaluate the role of endotoxin and various cytokines, including granulocyte colony-stimulating factor (G-CSF), granulocyte-monocyte colony-stimulating factor (GM-CSF), interleukin-6 (IL-6), interleukin receptor antigen (IL-RA), tumor necrosis factor (TNF), and

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A severely malnourished child falls easy prey to diarrhoeal disease and the resulting dehydration

tumor necrosis factor binding protein (TNF-BP) in the pathogenesis of leukaemoid reaction (LR) and haemolytic uraemic syndrome (HUS). One hundred and fifty-seven children aged one to five year(s) were enrolled in the study, of whom 26 developed HUS and 36 developed LR. Sixty-five age-matched children infected with *S. dysenteriae* type 1 who did not develop HU or LR, 30 children infected with *Shigella* other than *S. dysenteriae* type 1, and 84 children with watery diarrhoea not due to *Shigella* served as three control groups.

Preliminary analysis showed that the peak G-CSF was the highest in children with LR, and the peak values of the other cytokines were the highest in children who developed HUS. An association of TNF-BP with the development of HUS ($p<0.001$), and of G-CSF and GM-CSF with the development of LR was observed.

Volatile fatty acids (VFA) in experimental cholera and shigellosis
PI: G.H. Rabbani
Funded by: USAID

The use of short-chain fatty acids (SCFA) in the treatment of *Shigella*-induced colitis was evaluated in adult rabbits infected by direct inoculation of *Shigella flexneri* 2a (10^9/ml) into the colon through a trans-abdominal tube.

Within 24-48 hours of inoculation, all animals developed mucoid diarrhoea, excreted shigellae in the stool, and showed histologic evidence of acute inflammation in the colon and rectum. Treatment with daily colonic infusion of SCFA (butyrate, acetate, propionate in a molar ratio of 40, 60, and 30 mM) resulted in marked histological improvement of the inflammatory lesions in 80% of the animals within 96-120 hours; the other 20% showed mild, resolving colitis. Control animals treated with saline colonic infusions but without SCFA revealed an inflamed colonic mucosa characterized by superficial ulcerations, polymorphonuclear infiltrations in the lamina propria, crypt abscess formation and early fibrotic changes. Appearance of terminal ileitis was more common in the control animals than in the SCFA-treated animals.

The number and duration of faecal excretion of shigellae after starting treatment were significantly less in the treated animals than in the controls (10^{11} vs. 10^4/ml; 48 h vs. 120 h, respectively, $p<0.05$). We conclude that SCFA treatment results in histologic and bacteriologic improvement of colitis due to shigellosis.

Preliminary results of this study have been presented in the International Falk Symposium (#73) on Short-chain Fatty Acids held in Strasbourg, France, 8-10 September 1993.

Folic acid and watery diarrhoea
PIs: D. Mahalanabis and H. Ashraf
Funded by: USAID

A randomized, double-blind, placebo-controlled study was undertaken to evaluate the role of folic acid in treating 6 to 35 months old children with acute watery diarrhoea. The major outcome variables of this study are stool output and duration of diarrhoea. Patient recruitment has been completed and preliminary analysis showed that folic acid had no beneficial effect on acute watery diarrhoea of children.

Vitamin A supplementation in the treatment of shigellosis in children
PI: S. Hossain
Funded by: USAID

The study aimed at determining if a large dose of vitamin A reduces the severity of disease in patients with acute shigellosis among a population with marginal vitamin A deficiency. A randomized, double-blind, placebo-controlled trial was conducted in 85 children with shigellosis of less than 72 hours during July 1992-September 1994. The patients received 200,000 IU vitamin A either during entry into or exit from the study or control group respectively, along with antimicrobial therapy, and were followed up for five days. At the end of five days, the outcome variables observed in the intervention and control patients were: absence of blood in the stool (46% vs. 44%), mean stool frequency, absence of fever (86% vs. 85%), absence of abdominal tenderness (83% vs. 82%), improvement in appetite (56% vs. 44%), physicians' impression of clinical improvement (72% vs. 85%), and bacteriological cure (67% vs. 69%). These were all comparable between the two

groups. Therefore, a large dose of vitamin A had no impact on the course of shigellosis. Preliminary results were presented at the symposium on vitamin A held at ICDDR,B in October 1994.

Therapeutic efficacy of oral 5-Aminosalicylic acid in acute shigellosis
PIs: M.R. Islam and P.K. Bardhan
Funded by: USAID

Shigellosis remains the most definable cause of disease and death among the different diarrhoeal diseases. Resistance to antibiotics is emerging as a major obstacle to effective therapy, and thus it is important to identify effective non-antibiotic interventions in severe shigellosis. 5-Aminosalicylic acid (5-ASA) is a drug effective in the treatment of ideopathic inflammatory bowel diseases, particularly colonic diseases.

The objective of this study was to evaluate the therapeutic efficacy of 5-ASA in the treatment of acute shigellosis in adults in a double-blind, randomized, placebo-controlled trial where all patients received 5-ASA or the placebo in addition to antimicrobial therapy.

Of the stipulated 125 patients, 100 patients have been recruited. Being a blind trial, results are not yet known. However, no adverse effect has been noted to-date. 5-ASA, if found to be beneficial in hastening recovery from acute shigellosis, will be an important therapeutic advance in the management of this illness.

Moreover, further studies might be planned with stronger and more specific agents to be used alone or in different combinations.

The role of *Entamoeba histolytica* in the dysenteric syndrome in children and adults
PIs: D. Mahalanabis and P.K. Bardhan
Funded by: USAID

Dysentery is caused by different organisms, including bacteria and parasites, among which *Entamoeba histolytica* (EH) is an important one. Lack of reliable laboratory tests to identify severity and magnitude of amoebic dysentery has often led to improper diagnosis and treatment. The objectives of this study were to assess the magnitude, risk factors, and severity of EH-induced illness in patients visiting the Clinical Research and Service Centre of ICDDR,B at Dhaka. The study is designed as a case-control study. In addition to the standard methods of diagnosing EH-infection, newer and more advanced diagnostic methods, including stool culture for EH, EH isoenzyme analyses, and serum antibody response will be employed.

Of the proposed 55 cases and 275 controls, 44 cases and 194 controls have been recruited. The study is continuing.

Effect of a soluble fibre (partially hydrolyzed guar gum)-supplemented oral rehydration solution in the treatment of non-cholera diarrhoea in children
PI: N.H. Alam
Funded by: SANDOZ Nutrition, Bern, Switzerland

Considerable interest has recently been generated in the therapeutic application of dietary fibres and the soluble fibres in a variety of conditions. Partially hydrolyzed guar gum (Sun Fibre), an easily fermentable soluble fiber added to ORS, undergoes fermentation with the production of

Asem Ansari

Demonstration of ORS preparation at the Centre

short-chain fatty acids (SCFAs). For this study, it is hypothesized that SCFAs will result in improvement of colonic function, including absorption of salt and water, and thus reduce the severity of diarrhoeal illness. In a controlled clinical trial, this protocol proposes to study the effects of a soluble fibre-supplemented ORS in the treatment of acute non-cholera diarrhoea in children. Ninety male patients aged 4-18 months in two groups will be studied. One group will receive WHO-recommended ORS (WHO-ORS) supplemented with partially hydrolyzed guar gum and the other group will receive only WHO-ORS. After completion of the study, the clinical responses between the two groups will be compared. In total, 8 patients have been enrolled in the study so far.

A study to determine the importance of nosocomial transmission of measles and to validate salivary IgM for diagnosis of recent measles infection
PI: S.M. Akramuzzaman
Funded by: SDC

In the past decade, immunization programmes have increased measles vaccine coverage dramatically. However, measles still causes an estimated 880,000 deaths per year. As measles vaccine coverage increases, it becomes more important to target high-risk groups for vaccination, and to investigate patterns of measles transmission so that specific measles control activities can be conducted. One important mode of measles transmission demonstrated both in the developed and developing countries is nosocomial infection in children attending health care facilities. We are, therefore, conducting a clinic-based, case-control study to determine if a health facility visit is a risk factor for measles transmission. Two hundred and ninety-four measles cases and 1,176 controls with other diseases will be recruited from the Clinical Research and Service Centre of ICDDR,B and from Dhaka Shishu (Children) Hospital. Another 1,176 healthy controls will also be selected from the same neighbourhoods as cases. If nosocomial infection is documented to be an important risk factor for measles transmission, it will convince health care providers to adopt

Grass-roots level education on dietary sources of vitamins

policies to immunize children at every contact with health care facilities to reduce transmission of measles. Another important research area identified by WHO is the development of simple laboratory techniques to diagnose measles infection. The Public Health Laboratory Service (UK) has developed a method for detecting IgM in the saliva of recent measles cases by antibody capture. This could be used as a non-invasive technique for the confirmation of measles in a variety of epidemiological studies on measles in developing countries. We are validating this salivary IgM assay against serology (serum IgM). A sub-sample of 80 measles cases and 80 controls recruited from the above study will be used in validating this technique.

A non-invasive test to assess gastric acid output
PI: S.A. Sarker
Funded by: SDC

The standard method for measuring gastric acid secretion in humans requires gastric intubation

Asem Ansari

and aspiration of gastric acid upon stimulation. A tube-less test for gastric acid measurement which would be ideal for field use is currently not available. The objective of this study was to validate two simple non-invasive tube-less tests: (a) Measurement of Titratable Urinary Acid Output (UAO) and (b) Applied Potential Tomography (APT) using impedance imaging. Fifteen healthy adult volunteers have been studied initially to standardize the tube-less tests against standard intubation test. Preliminary observations suggest that both the tube-less tests may be equally useful as intubation test for assessment of gastric acid output. Further studies in children are in progress.

Alanine and glucose-based hypo-osmolar oral rehydration solution in infants with persistent diarrhoea: a controlled trial
PI: S.A. Sarker
Funded by: PDF

To evaluate the efficacy of a hypo-osmolar and standard (World Health Organization) oral rehydration salt (WHO-ORS) solution in persistent diarrhoea, a randomized controlled clinical trial was conducted in 55 children. After one day of observation, the children were assigned to one of the three solutions: Standard ORS (WHO-ORS) (osmolarity 311 mOsmol/l), hypo-osmolar ORS containing L-alanine and glucose (osmolarity 255 mOsmol/l), or intravenous (I.V.) polyelectrolyte solutions (osmolarity 293 mOsmol/l) for ongoing replacement of stool loss for the subsequent four days. An excellent acceptability of ORS (101-160 ml/kg body weight.day) by the children was observed. No significant differences were observed in the total intake of solutions and food, or frequency of stool among the groups. Stool outputs were significantly less in infants receiving hypo-osmolar ORS than in those receiving WHO-ORS during 0-24 hour (p=.04), during 0-48 hour (p=.01), during 0-72 hour (p=.04) and during 0-96 hour (p=.03). Furthermore, hypo-osmolar ORS containing L-alanine and glucose is as efficacious as I.V. solution and more effective than WHO-ORS in replacement of ongoing stool loss in persistent diarrhoea.

Promotion of exclusive breast-feeding in mothers of infants with acute diarrhoea
PI: R. Haider
Funded by: WHO

Bangladeshi mothers traditionally breast-feed but also start early complementary feeding by 1-12 weeks of age, which often results in diarrhoea and malnutrition.

The objective of this study was to assess whether intensive breast-feeding counselling and lactation support can help mothers of partially breast-fed infants to exclusively breast-feed during a diarrhoeal episode, and to sustain this practice at home.

Recruitment of patients has been completed and follow-up is continuing. Preliminary analysis of the first 100 patients showed that breast-feeding counselling for mothers of partially breast-fed infants had very high success rates.

> At discharge: 31/50 (62%) of the infants in the counselled group were exclusively breast-fed compared to 2/50 (4%) of the controls.

> After 2 weeks at home: 33/43 (77%) of the counselled group were breast-feeding exclusively compared to 4/43 (9%) of the controls. All the mothers, intervention and controls, were counselled on this visit.

> After 6 weeks: all 33 mothers who were on ebf were continuing as such (100%), compared to 7/27 (26%) of the controls.

A study on immunologicai effect of vitamin A and zinc in a placebo-controlled 4-cell trial
PI: S.K. Roy
Funded by: USAID

The project will attempt to identify the effect of vitamin A supplementation on immunity of children. The immune effect will be compared with other micronutrients including zinc. Both cell-mediated and humoral immunity will be compared in each child of moderate malnutrition before and after two months of vitamin A or zinc therapy. In each group, 50 children will be studied in 4 different groups. The organization of the study has been completed. Reagents and kits for the study of immune function have been ordered. Recruitment of technical staff has been completed, and patient recruitment will start by the 1st week of February 1995.

Vegetable protein source for feeding malnourished children during recovery from shigellosis
PI: I. Kabir
Funded by: International Atomic Energy Agency (IAEA) and Core funds

Shigellosis is a major cause of morbidity and mortality in children in developing countries. A significant proportion of children with shigellosis also develop secondary protein-energy malnutrition (PEM). Previous studies performed at ICDDR,B have shown accelerated catch-up growth of children with a high-protein energy (based in animal protein) diet during recovery from shigellosis. Since the sources of dietary protein used in the initial study are costly in communities where PEM is most common, we proposed to study a low-cost, plant protein-based dietary supplementation to accelerate catch-up growth as an alternative to the animal protein-based diet previously used.

The study will be conducted in 2 to 5 year-old children during recovery from acute shigellosis. The relative efficacy of a standard diet recommended by WHO/FAO will be compared with two nutrient-dense diets, one based on animal protein to provide 15% energy as protein, and the other based on plant protein with similar energy and micronutrient concentration supplemented to match the intake in the animal protein group. The children will be kept in the metabolic ward and will be fed the diets for a 3-week period. Anthropometric measurements will be made twice weekly, resting energy expenditure and protein turn-over study will be done before and after the dietary intervention. Concentration of serum proteins, IGF-I, and IGFBPs will be determined before and after intervention. The result of this study will determine whether the anabolic effects during feeding with protein from animal source can be replicated with a more economical plant protein-based diet. The findings of this study have implications in reducing the adverse nutritional consequences of shigellosis, particularly in malnourished children.

Impact of ready-to-use packaged rice-ORS on morbidity and nutrition of infants and young children, and response of mothers when provided as an anti-diarrhoeal medicine in rural Bangladesh
PIs: A.S.G. Faruque and D. Mahalanabis
Funded by: SDC

This study is to evaluate the role of ready-to-use packaged rice-ORS in reducing the number and duration of diarrhoeal episodes and in improving nutrition in infants and young children with mild diarrhoea in rural communities. The children of similar communities received either ready-to-use rice-ORS or glucose-ORS. About 1,200 infants and young children were included in the study to document diarrhoeal morbidities and nutritional changes by daily home visits. Health care-seeking behaviour of the mothers was also monitored. To date, the children have been followed up for 30 months. Preliminary observations showed that

rural mothers accepted the precooked popped rice-ORS as an instant ORS. Furthermore, the energy-dense rice-ORS (80 g) appeared to have potential to enhance nutritional recovery.

The results of the study are expected to contribute to the formulation of future health policy in diarrhoeal disease control and management. Data management of this quite large longitudinal study is nearly completed, and a final report will be completed soon.

Role of micronutrient mixture (zinc, selenium, iron, copper, folate) in reducing the incidence and severity of acute diarrhoea and acute respiratory infections, and in improving nutrition in children: a randomized community intervention trial

PIs: D. Mahalanabis and A.S.G. Faruque
Funded by: SDC

The objective of this randomized community intervention trial was to evaluate the role of specific micronutrients in reducing the number of acute respiratory infections (ARI) and diarrhoeal episodes, average duration of ARI and diarrhoeal episodes, and total number of days the patient suffers from ARI and diarrhoea during the study period. The study also evaluated the effect of the mixture on improving nutrition in infants and young children in rural communities.

Twenty-four communities were randomly allocated to different intervention groups. Children in the communities were given a micronutrient mixture comprising zinc, selenium, iron, copper, and folate; those in another 6 received a mixture of iron, copper, and folate; another group from 6 communities got only zinc and selenium; and the remaining group was provided a multivitamin preparation. The multivitamins were also present in the mixtures of the other 3 groups. One thousand two hundred infants and young children were monitored for diarrhoea and ARI morbidities daily and their nutritional changes on a monthly basis.

The findings may lead to an improved health strategy to prevent and control diarrhoea and ARI illnesses. Data management of this quite large longitudinal study is nearly completed. The final report will be made available soon.

Role of vitamin A and zinc in reducing diarrhoea duration, the rate of persistent diarrhoea, and improving nutritional recovery: a randomized, double-blind clinic-based trial with community follow-up

PIs: D. Mahalanabis, D. Habte
and A.S.G. Faruque
Funded by: USAID

Sufficient evidence has recently accumulated to warrant a clinical trial and community follow-up of an appropriate mixture of vitamin A and zinc to determine its public health impact in diarrhoeal diseases. This study aimed at determining the effect of vitamin A and zinc, alone or in combination, on morbidity from acute watery diarrhoea in its duration and improved nutritional recovery during convalescence. The study has enrolled 684 infants and young children. The mixture was administered daily and the children were evaluated in the clinic and households at regular intervals for 15 days. Vitamin A supplementation and administration of zinc, if found to have a positive impact on morbidity from diarrhoea and nutrition, will have important public health implications in control of diarrhoeal diseases. Data are being analyzed, and the final report will be made available soon.

Application of the deuterated retinol dilution technique to assess vitamin A requirements in adult healthy volunteers (an addendum)

PIs: R.N. Mazumder and M.A. Islam
Co-investigators: M. Haskel, K.H. Brown
and D. Mahalanabis
Funded by: University of California-Davis, USA

Second phase of the study

To measure the change in plasma-specific activity of deuterated retinol over a period of 127 days to estimate the pool size and whole-body vitamin A disposal rates, 15 healthy adult volunteers of 18-20 years were enrolled after preliminary screening of their vitamin A status. Subjects with signs of vitamin A deficiency as with acute or chronic infections or with history of steatorrhoea (greasy or foul smelling stools >twice/day) were excluded.

Individuals with intestinal helminths or giardiasis were treated and included in the study after screening procedures at least one week after successful eradication of their parasites. C-reactive protein was measured simultaneously to confirm the absence of any sub-clinical infection. Following a 12-hour fasting, subjects were admitted in the outpatient department for assessment of their plasma retinol concentration and of the response of plasma retinol five hours after an oral dose of 1,000 micrograms of retinol (relative dose response test, RDR). During the study period, dietary intake of each subject was measured before each meal and before breakfast. Serum albumin and SGOT were also measured before inclusion in the study.

Child Health Programme
Coordinator: M.A. Islam
Funded by: DANIDA

For the past seven years, the Child Health Programme (CHP) has been providing preventive health care to children and their mothers reporting to the CRSC to receive treatment for diarrhoea. In addition, the Programme conducts research, and has been involved in training people from both Bangladesh and abroad. The preventive services include health education, childhood immunization, nutritional rehabilitation, growth monitoring, and family planning. Funding from DANIDA for the Programme was scheduled to be completed by the end of 1993. However, as a result of the Programme's success in meeting its objectives, "carry-over" funds prompted DANIDA to kindly agree to a no-cost extension to 1994. Patient treatment at the CRSC remained high (approximately 114,151) during the reporting period, and 33,115 group health education sessions were organized to cover 90% of them. The topics discussed included home management and prevention of diarrhoea, immunization and nutrition. Videotape films were routinely shown on night blindness, immunization and family planning. Approximately 95% of the mothers received individual training.

Children less than 2 years of age were immunized against six vaccine-preventable diseases, and females aged 15 to 45 years were motivated for tetanus toxoid vaccine. Among the women in the target age group, 9,215 received a first dose of tetanus toxoid vaccine and 10,704 received a second or booster dose. Most children reporting to the CRSC to receive treatment for diarrhoea were malnourished. Last year, 264 severely malnourished children received inpatient nutritional rehabilitation. During 1994, forty-eight new cases received full-course treatment for tuberculosis. Eligible couples reporting to the CRSC were encouraged to practise family planning, and 443 mothers adopted one of a variety of methods offered; 21 pregnant mothers also received a safe-delivery kit.

The Programme maintained its collaboration with national and international organizations. Two international research associates joined to work in an ICDDR,B-University of Edinburgh collaborative project utilizing the CHP facilities in November 1994.

Hospital Surveillance Programme
PIs: D. Mahalanabis and A.S.G. Faruque
Funded by: UNDP/WHO

More than 100,000 patients attend this hospital each year. Surveillance activity provides valuable information regarding the patient population and the spectrum of diseases. Since it is not possible to study each patient in detail, a representative (4%) systematic sample of all patients is chosen for in-depth study. The objectives of the Hospital Surveillance Programme are:

> to create a database on diarrhoeal disease which is reported to the Government of Bangladesh to assist in the development of health policy;

> to create a database for research protocols;

> to generate preliminary information to design new research protocols;

> to furnish information to be applied for improvement in patient care and preventive care; and

> to monitor patients and detect changes in

disease patterns including drug sensitivity (particularly for cholera and shigellosis);

Data collection

In addition to receiving routine medical care, patients or their parents are interviewed by members of the surveillance team to obtain information on: socioeconomic and demographic characteristics; housing and environment; feeding practices, particularly of infants and young children; use of drugs and fluid therapy at home; clinical characteristics on presentation; anthropometric measurements; nature and type of treatment received at hospital; and outcome of treatment and causative agents and their drug sensitivity.

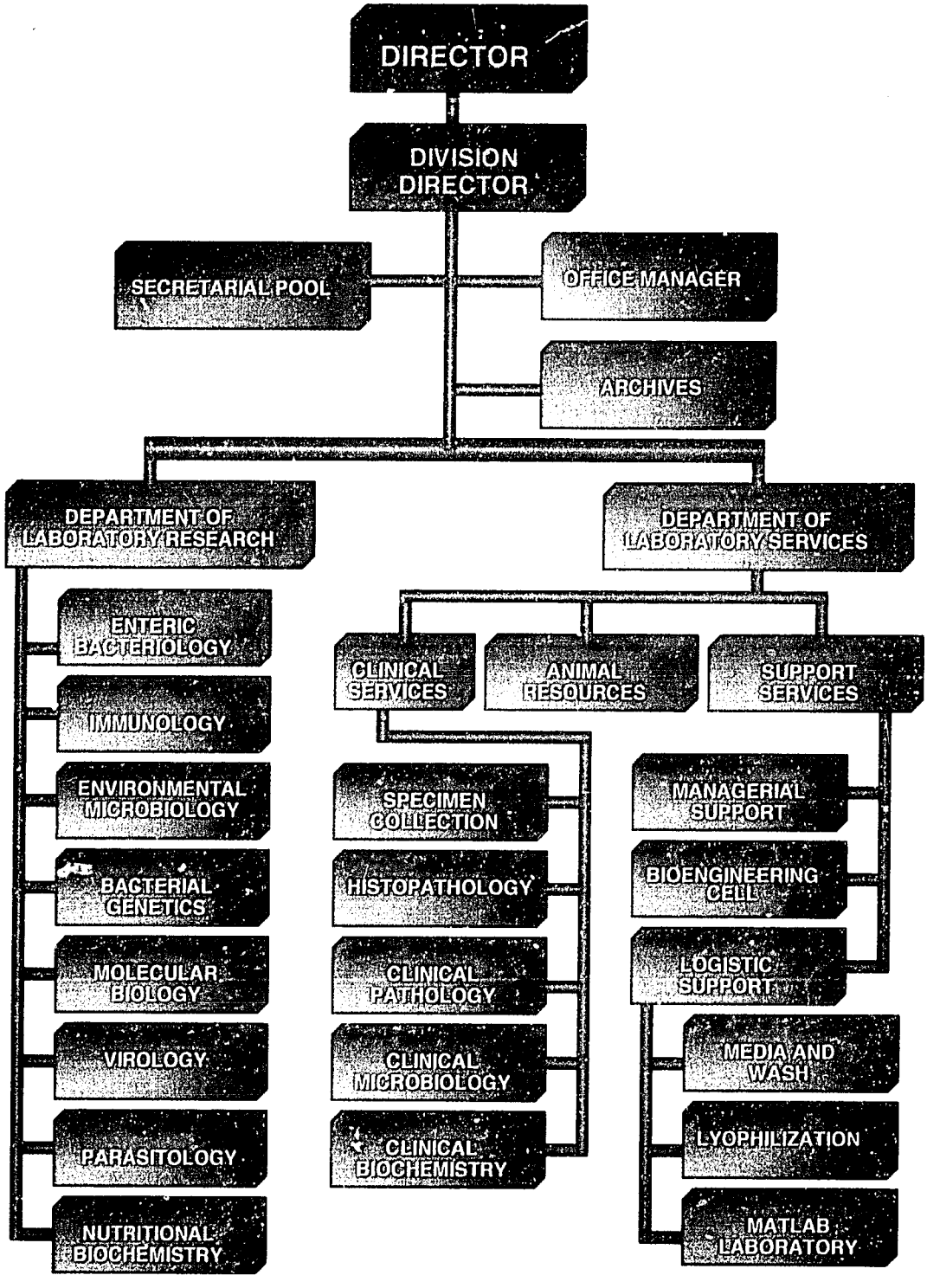
During the year, 4,566 patients were enrolled in this programme. This year's epidemic of cholera was caused primarily by *V. cholerae* O1, and the new serogroup O139. The most common species of *Shigella* was *S. flexneri* (45%). The following table shows the aetiological agents isolated from these patients.

Aetiological agents isolated from the patients in the Surveillance Programme in 1994

Month	No. of patients	*V. cholerae* O1	*V. cholerae* O139	*Shigella*	Other vibrios	Rotavirus	*Salmonella*
January	385	32	10	50	32	103	10
February	258	22	5	26	21	64	6
March	345	41	8	30	46	49	7
April	479	76	10	39	78	21	5
May	502	100	14	40	95	39	15
June	379	68	9	40	85	47	8
July	342	50	6	34	91	57	7
August	375	62	5	33	85	40	10
September	391	47	12	48	82	53	16
October	404	75	32	45	55	56	21
November	363	86	19	50	57	56	16
December	343	67	15	43	37	119	3
Total	4,566	726	145	478	764	704	124
%		15.9	3.2	10.5	16.7	15.4	2.7
Estimated total*	114,150	18,150	3,625	11,950	19,100	17,600	3,100

*Extrapolated to the total number of patients attending the treatment facility

LABORATORY SCIENCES DIVISION



LABORATORY SCIENCES DIVISION

Division Director: R. Bradley Sack[a]

Divisional Highlights

- Equipment ordered using the Sasakawa fund has been procured.
- The incinerator was installed on the animal house premises.
- The Division organized an international training course on Laboratory Diagnosis of Common Diarrhoeal Disease Agents with ten participants from seven developing countries in Asia and Africa.
- The second Divisional Retreat was held at the Centre's Guest House in Dhaka. Fund-raising priorities of the Division constituted the main agenda.

The Laboratory Sciences Division: (a) conducts laboratory-based research on diarrhoea, respiratory tract infections, malnutrition, and reproductive tract infections; (b) provides laboratory support to clinical, community, field, and environmental studies undertaken by the Centre scientists; (c) provides diagnostic laboratory services to patients attending the Clinical Research and Service Centre (CRSC) at Dhaka, the Matlab Diarrhoea Treatment Centre (DTC), and private patients; and (d) facilitates training of graduate and postgraduate students in laboratory research and laboratory diagnostic procedures.

To reflect the dichotomy of the functions of the Division, it is organized into two departments: Department of Laboratory Research, headed by Dr. M. John Albert, and Department of Laboratory Services, headed by Dr. Mahbubur Rahman. The Division has 2 international, 22 national level scientists, and 110 support staff. Dr. R. Bradley Sack, the Division Director, and Dr. Moyenul Islam, the histopathologist and previous head of the Department of Laboratory Services left after successful completion of their contracts with the Centre. Recruitment is underway to fill these vacant positions. Collaboration with overseas institutions continued to increase; the Division now has collaborative projects with at least 25 overseas institutions in both developing and developed countries. Some of the major accomplishments of the Division during 1994 are listed below:

- The Division, in collaboration with the New Horizons Diagnostic Laboratory, Maryland, USA, developed a monoclonal antibody-based colorimetric immunoassay called Bengal SMART for rapid field diagnosis of cholera due to *V. cholerae* O139 Bengal.
- Thermal stability studies on the killed oral *V. cholerae* O1 whole cell/cholera toxin B-subunit vaccine suggested that the vaccine is remarkably stable in terms of immunogenicity at room temperature.
- Assay of serum antibodies to *Helicobacter pylori* as an indicator of *H. pylori* infection (which results in decreased gastric acid) suggested that *H. pylori* infection is a risk factor for severe cholera for persons with no vibriocidal antibodies.
- Demonstration of the occurrence of non-culturable *V. cholerae* O1 in blue-green algae from surface water samples in Bangladesh constituted the first step in confirming that blue-green algae are potential reservoirs of *V. cholerae* O1.
- Provisional serotypes of *Shigella dysenteriae* were identified, and their serotype designation as *S. dysenteriae* 14 and 15 was proposed.

[a]M. John Albert (July-December)

- Comparison of assays for body store of vitamin A suggested that the modified relative dose response (MRDR) test is not suitable for malnourished populations.

- During the year, 52 papers were published by the scientists of the LSD, and 4 new protocols were developed. At present, there are 23 ongoing studies. These are reported below by the eight laboratories in the Department of Laboratory Research: Molecular Biology, Bacterial Genetics, Virology, Immunology, Environmental Microbiology, Enteric Bacteriology, Parasitology and Nutritional Biochemistry.

DEPARTMENT OF LABORATORY RESEARCH
Head: M. John Albert

Enteric Bacteriology Laboratory
Head: M. John Albert

The Enteric Bacteriology Laboratory is involved in the following studies:

> Bacterial causes of diarrhoea

> Pathogenic mechanisms of diarrhoea

> Bacterial strain differentiation for epidemiology

> Development of simple and improved diagnostic tests for bacterial diarrhoeal pathogens.

Studies on *V. cholerae* O139 Bengal
PI: M.J. Albert
Funded by: Core funds

V. cholerae O139 Bengal is now established as the second aetiologic agent of cholera and also probably as the aetiologic agent of the eighth pandemic of cholera. We continued to carry out collaborative studies on this organism with overseas laboratories: the Karolinska Institute, Stockholm and the University of Adelaide, Australia. To explain the differences in the prevalence of infections due to *V. cholerae* O1 and *V. cholerae* O139, we are carrying out *in vitro* competition studies among these two bacteria and other members of autochthonous flora of surface waters. Preliminary results indicate varying degrees of competition between bacteria in different pairs.

Studies on cross-reacting bacteria
PIs: M.J. Albert and M. Ansaruzzaman
Funded by: Core funds

a. *Aeromonas trota*: We have identified several strains of *Aeromonas trota* from surface water samples in Bangladesh that were agglutinated by *V. cholerae* O139 antiserum. We studied these isolates for their virulence properties to find out whether they could cause cholera-like illness and also whether they could be misdiagnosed as *V. cholerae* O139 by the rapid diagnostic test Bengal SMART. Our results indicate that *A. trota* strains do not produce cholera toxin, the major pathogenic factor of *V. cholerae* O1 and 0139 and several other diarrhoeagenic factors. Hence these organisms probably do not cause diarrhoea. They also tested negative in the Bengal SMART test.

b. *Plesiomonas shigelloides* and *Klebsiella pneumoniae*. We have identified strains of *P. shigelloides* and *K. pneumoniae* that cross-react with *Shigella flexneri* 6 and the common group antigen present in *S. flexneri* and *S. dysenteriae* 1. The ability of *P. shigelloides* and *K. pneumoniae* to cross-protect against shigellosis is being explored.

Proposal for new serotype designations of *Shigella dysenteriae*
PIs: M.J. Albert and M. Ansaruzzaman
Funded by: Core funds

Organisms belonging to *S. dysenteriae* are causative agents of dysentery. Currently, 13 different serotypes of *S. dysenteriae* are

recognized. We have identified *S. dysenteriae*-like organisms that do not belong to the 13 serotypes from the dysenteric stools of several patients. These organisms were, however, identical to two of the previously described provisional serotypes of *S. dysenteriae*. In collaboration with Dr. B. Rowe at the Enteric Bacterial Pathogens Reference Laboratory, Colindale, U.K., we characterized these bacteria and proposed two new serotype designations of *S. dysenteriae* 14 and *S. dysenteriae* 15.

Biochemical fingerprinting in epidemiological studies of bacterial diarrhoeal pathogens
PI: M.J. Albert
Funded by: SAREC

In a collaborative project with Prof. R. Möllby and his group at the Karolinska Institute, Stockholm, Sweden, we found that biochemical fingerprinting with the PhP system is a simple, reliable and highly discriminating method for typing *V. cholerae*. The PhP system, in conjunction with DNA typing methods, can be used for obtaining valuable information in epidemiological studies of *V. cholerae*.

Role of *Helicobacter pylori* infection as a risk factor for cholera and as a modifier of oral cholera vaccine efficacy
PIs: M.J. Albert and John Clemens (NIH, USA)
Funded by: National Institutes of Health, USA

To assess whether *H. pylori*-infected individuals are at increased risk of contracting cholera, and whether in such individuals an oral cholera vaccine has reduced efficacy, this study was undertaken. Stored sera from individuals who participated in the killed oral cholera vaccine trial in Matlab in 1985 are being screened for antibody to *H. pylori* as evidence of *H. pylori* infection.

Production and characterization of monoclonal antibodies to the virulence-associated antigens of enteropathogenic *Escherichia coli* for diagnostic use
PI: M.J. Albert
Funded by: USAID

We plan to produce monoclonal antibodies against the virulence antigens with a view to developing immunodiagnostic assays. This is a collaborative project between Dr. James B. Kaper and his colleagues at the University of Maryland, Baltimore, USA, and Enteric Bacteriology Laboratory, and Immunology Laboratory (Dr. F. Qadri and Dr. T. Azim) of ICDDR,B.

Controlled study on the role of cytolethal distending toxin (CLDT)-producing *Escherichia coli* in diarrhoea
PIs: M.J. Albert, S.M. Faruque
and A.S.G. Faruque
Funded by: UNDP

With a recently produced DNA probe by Dr. James B. Kaper *et al.* at the University of Maryland, Baltimore, MD, USA, we screened *E. coli* isolates

Centre's laboratory scientists in action

Fakrul

from 660 hospitalized children under 5 years of age with diarrhoea and an equal number of matched neighbourhood community controls. CLDT *E. coli* was isolated from 17 (2.6%) of the 660 children with diarrhoea, and 3 (0.45%) of the 660 control children without diarrhoea (p=0.001 by X^2-test). Thus, data suggest that CLDT *E. coli* can cause diarrhoea in a small proportion of Bangladeshi children.

Immunology Laboratory

Heads: T. Azim and F. Qadri

Several sensitive immunological techniques are being employed to understand the immune response in patients with diarrhoeal diseases, such as shigellosis, persistent diarrhoea, and cholera. For these purposes, the cellular and humoral responses involving both mucosal and systemic components of the immune system are being studied. In addition, facilities are available for production of monoclonal antibodies (MAbs) and their utilization for rapid diagnosis of diarrhoeal pathogens.

During the year, 7 protocols were in progress in the laboratory, of which 2 were carried out in collaboration with the Karolinska Institute, Sweden, and 2 with the Department of Medical Microbiology and Immunology, University of Göteborg, Sweden.

Production of monoclonal antibodies

PI: F. Qadri
Co-investigator: T. Azim
Funded by: USAID

As part of the study, two rapid immunoassays utilizing monoclonal antibodies ICL11 and ICL12, specific for the lipopolysaccharide of *Vibrio cholerae* O139, have been developed and tested. The assay involving the MAbs in a coagglutination test showed a sensitivity of 92% and specificity of 100% for detecting *V. cholerae* O139 directly from 120 diarrhoeal stools, while MAb ICL12 used in a sensitive test Bengal SMART (sensitive membrane antigen rapid test) showed a sensitivity of 100% and a specificity of 97% when evaluated using 189 diarrhoeal stool samples. Results show that Bengal SMART is suitable for use in field settings for rapid diagnosis of cholera caused by *V. cholerae* O139.

Local and systemic antibody response to a peroral inactivated ETEC vaccine

PIs: P.K. Bardhan and F. Qadri
Funded by: SAREC

The immunogenicity and reactogenicity of a peroral ETEC vaccine consisting of a combination of formalin-killed enterotoxigenic *E. coli* strains expressing colonization factor antigens (CFA) and a recombinant cholera toxin B subunit have been tested in 27 healthy Bangladeshi adults. No adverse reactions were observed in the volunteers that could be attributed to the vaccine. Results of the immune response generated after vaccination are being evaluated. For these purposes, both mucosal and the systemic immune responses have been studied. The immune response generated in patients with diarrhoea caused by ETEC strains is also being studied using similar techniques as for the vaccinees.

Local and systemic immune response in patients in a diarrhoeal epidemic due to *Vibrio cholerae* O139

PI: F. Qadri
Co-investigators: T. Azim, M.J. Albert, M.A. Salam, A.M. Khan, R. Bradley Sack and A-M. Svennerholm
Funded by: SAREC

The aim of this study was to examine the cellular and humoral immune responses, both systemic and local, in adult patients with diarrhoea due to *V. cholerae* O139 and to compare the response with patients with diarrhoea due to *V. cholerae* O1. An evaluation of the vibriocidal antibody response in these patients showed that there was significant elevation in the homologous antibody response in both groups of cholera patients and a lack of heterologous response.

Further studies are being carried out to assess the correlation of this response with the mucosal immune response in the gut.

Study of the immune response to *Shigella dysenteriae* 1 in an effort to identify abnormalities leading to the development of leukaemoid reaction
PI: T. Azim
Co-investigators: M.A. Salam, J. Hamadani, F. Qadri, M.A. Wahed and L.N. Islam
Funded by: USAID

The immune responses of three groups of children with both uncomplicated and complicated *S. dysenteriae* 1 infection and age-matched, healthy controls were compared. Children with complications included those with leukaemoid reaction, haemolytic-uraemic syndrome, toxic megacolon and septicaemia. The causes of these complications are unknown, but an inappropriate immune response may be one of the precipitating events. Results from this study showed that some aspects of the immune response were altered in complicated versus uncomplicated *S. dysenteriae* 1 infection. Thus, there are more polarized (activated) neutrophils in the circulation, lower numbers of peripheral blood helper T cells, decreased cell-mediated immunity (as measured by skin tests) to various antigens, lower stool interleukin-6 and tumour necrosis factor-α concentrations and lower stool anti-lipopolysaccharide antibodies in children with complicated versus uncomplicated *S. dysenteriae* 1 infection.

Immune status of children who develop persistent diarrhoea
PI: T. Azim
Co-investigators: M.A. Salam, J. Hamadani, F. Qadri, M.A. Wahed and L.N. Islam
Funded by: USAID

Children aged 7-24 months coming to the Clinical Research and Service Centre of ICDDR,B with a history of watery diarrhoea for 7±1 days are being enrolled in the study. These children are hospitalized until diarrhoea resolves. If diarrhoea persists for a further 7-9 days (i.e. diarrhoea for 15-17 days), the child is classified as having persistent diarrhoea, but if diarrhoea resolves before 7-9 days, the child is classified as having acute diarrhoea.

Healthy control children matched for age, attending the Nutritional Follow-up Unit of ICDDR,B, are also being enrolled. Thus, there are 3 study groups: acute diarrhoea, persistent diarrhoea and healthy controls.

Results so far show that the phenotype and proliferative responses to mitogens of peripheral blood lymphocytes are similar in the 3 groups of children. Granulocytes are more activated in children with persistent than with acute diarrhoea in that they phagocytose more yeast particles.

Environmental Microbiology Laboratory

Head: Md. S. Islam

The Environmental Microbiology Laboratory provides interdepartmental services for testing environmental samples supplied by the Clinical Sciences and Community Health Divisions. Various environmental samples from different national and international institutions of Bangladesh are tested in this laboratory. Two hundred and two samples, including rectal swab, stool, water, and fish, were tested in this laboratory during 1994. The following three protocols are ongoing in this laboratory:

Investigation of the carrier state and the role of animate and inanimate objects as reservoirs or secondary hosts of shigellae
PIs: Md. S. Islam and M.J. Albert
Funded by: SDC

This project was both a laboratory and field-based study. The laboratory-based study showed that *Shigella dysenteriae* 1 survived up to 20 days in microcosms in culturable state, but survived in non-culturable state up to 3 weeks after being non-culturable.

It was also found that on inanimate objects like wood, plastic and cloth, *S. dysenteriae* survived up to 12 hours, and on glass and aluminium surfaces up to 6 and 4 hours respectively. The field studies were carried out to detect shigellae from various household samples, (e.g. people's hands and rectal swabs of family

members, food, clothes, and bathroom water pot) using conventional cultural, PCR, and FA techniques. We conclude that people must be educated about personal, domestic and environmental hygiene to prevent transmission of shigellosis in the home environment.

Microbiological investigation of duckweed project in Mirzapur
PI: Md. S. Islam
Funded by: SDC

This study is being carried out to investigate the microbiological quality of duckweed, the water in which it is grown, and the fish which eat it. The purpose is to determine whether there are any health hazards of growing duckweed on sewage water.

Every month, various samples, including water, duckweed, fish and stool, are collected from the study area (Kumudini Hospital campus, Mirzapur). Eleven locations have been selected from which samples are collected, and microbiological and chemical analyses are performed. From May to December, 110 water, 100 duckweed, and 45 fish samples were collected and processed in the laboratory.

Survey of culturable *Vibrio cholerae* in the aquatic environment of Matlab, Bangladesh
PI: Md. S. Islam
Funded by: BADC

An environmental surveillance of *V. cholerae* O1 and O139 is being conducted in Matlab. Various environmental samples, such as plants, water, phytoplankton, zooplankton, snails and oysters, are collected at 15-day intervals from 4 selected ponds.

Two hundred and eighty samples have been collected so far and processed to culture *V. cholerae* O1 and O139. All these samples were cultured on TCBS and TTGA media following standard procedures. Of the 280 samples, only 3 (water, snail, and zooplankton) yielded *V. cholerae* O139 by culture technique. No *V. cholerae* O1 have been detected from any of the samples.

Bacterial Genetics Laboratory
Head: Z.U. Ahmed

Study on live oral cholera candidate vaccine strains, including mutants of the new serogroup *V. cholerae* O139 Bengal with respect to their mucosal colonization ability and protective efficacy, was the major focus of work during 1994.

Evaluation of live oral cholera vaccine candidates in rabbit RITARD model
PI: Z.U. Ahmed
Funded by: WHO

Mucosal colonization of attenuated strains of *V. cholerae* O1 and O139 was determined in rabbit ileum 18 hours after oral feeding. Strain CVD103Hg-R, which is a Tox$^-$ derivative of *V. cholerae* 01 strain 569B, had undiminished colonization ability. A Tcp$^-$ mutant of *V. cholerae* O1 strain O395, designated as JJM16-9, completely lost the ability to colonize rabbit ileum, while a Tcp$^-$ mutant of *V. cholerae* 0139 had normal colonization ability.

Oral immunization of rabbits with strains CVD103Hg-R and JJM16-9 was carried out to test their protective efficacy. Strain CVD103Hg-R provided excellent protection after homologous challenge (protective efficacy 85%). Interestingly, immunization with strain JJM16-9, which consistently failed to colonize either ileum or jejunum, provided the same level of protection after homologous challenge.

Similar studies with another attenuated *IrgA* mutant, coding for an iron-regulated outer membrane protein, are in progress. If available, studies on an *mshA* mutant lacking mannose-sensitive pilus antigen will be undertaken.

Molecular Biology Laboratory
Head: S.M. Faruque

The Molecular Biology Laboratory is involved in the development and application of molecular techniques to identify and characterize diarrhoea-

genic organisms. The technical facilities available in this laboratory range from gel electrophoresis, nucleic acid preparation, hybridizations using both radio-labelled and non-radioactive probes, to the sophisticated techniques of DNA sequencing and DNA amplification by polymerase chain reaction (PCR). The laboratory has recently procured a DNA synthesizer for the synthesis of oligonucleotides to be used as probes and primers for PCR assays.

Identification of enteric pathogens using specific DNA probes
PI: S.M. Faruque
Funded by: USAID

The protocol was concluded in December 1994. Major accomplishments and findings of the protocol are as follows:

> Development and standardization of DNA probes to identify diarrhoeagenic *Escherichia coli*.

> Identification of enterotoxgenic (ETEC), enteropathogenic (EPEC), and enteroaggregative (EAggEC) *Escherichia coli* as causative agents of diarrhoea in Bangladeshi children.

> Establishment of ribotyping technique and its application to differentiating pathogenic strains in epidemiological studies.

> Genetic characterization of the new epidemic strain of *V. cholerae* serogrouped as O139. Comparative molecular analysis of the cholera toxin genes and conserved rRNA genes has confirmed the clonal nature of the epidemic strains isolated from cholera patients in Bangladesh and India, and from surface water in Bangladesh.

Identification of enteric pathogens in biological specimens by specific DNA amplification
PI: S.M. Faruque
Funded by: USAID

This study employs the polymerase chain reaction (PCR) to amplify specific segments of pathogenic genes and thus identify the enteric pathogens. The aim is to develop and standardize rapid and sensitive diagnostic techniques for different enteric pathogens and test the applicability of these techniques in clinical and epidemiological studies.

PCR assays have been standardized for *Shigella*, enterotoxigenic *E. coli*, and toxigenic *V. cholerae* O1 and O139 strains. The PCR assay for *V. cholerae* O1 has been found to be applicable in environmental studies to detect cholera toxin-producing *V. cholerae* in environmental water samples, where *V. cholerae* cannot be detected by conventional culture techniques. To facilitate further studies, new PCR assays for the genes for Zonula Occludens Toxin (*zot*) and the toxin coregulated pili (*tcp*A) have been developed and standardized.

Characterization of epidemic strains of *Vibrio cholerae* O1 and non-O1 based on genetic and phenotypic traits
PI: S.M. Faruque
Funded by: USAID

The aim of the study is to characterize epidemic strains of *Vibrio cholerae* in Bangladesh and other countries based on genetic and phenotypic characteristics. Toxigenic *V. cholerae* strains have been collected from various regions of the world, and these are being analyzed to study their genetic relatedness and their contribution to cholera epidemics.

Virology Laboratory

Head: L. Unicomb

The Virology Laboratory has been carrying out research on diarrhoeal viruses, measles virus, poliovirus and more recently, respiratory viruses. Group A rotavirus is the focus of our diarrhoeal virus research interests since it causes about 15-20% of diarrhoeal illness among patients who come to the Clinical Research and Service Centre. Ultimately, research on rotavirus will aid in vaccine development. Tests to analyze antibody response to rotavirus infection are set up, and we are ready to analyze samples from vaccine trials.

Study of the antibody responses to neonatal rotavirus infection
PIs: L. Unicomb and N. Shahid
Funded by: USAID

We tested cord blood and breast milk collected in the first week of enrollment, and stool samples for antirotaviral antibodies from neonates with and without rotavirus infections.

It was found that cord blood and breast milk antibody levels did not correlate with infection of neonates with rotavirus. Presumably, antibodies found in the stool of uninfected neonates were mostly from breast milk, yet single breast milk samples collected in the first few weeks did not appear to have higher levels of antibodies among non-infected neonates suggesting that a single sample is not adequate for the assessment of antibodies being passed to babies.

Protective role of stool antibodies against symptomatic enteric adenovirus infection
PI: L. Unicomb
Funded by: USAID

We examined longitudinally collected sequential stools from 8 infants who had an enteric adenovirus (EAd) infection for the presence of antiadenoviral antibodies. We found that neutralizing and non-neutralizing antiadenoviral antibodies were frequently detected in the stools of these infants. EAd and non-enteric adenovirus infections detected by antibody rise in stool or detection of viral antigen were common in these infants. Three of the 5 infants who had an EAd infection with diarrhoea had experienced a previous EAd infection suggesting that EAd infections do not give rise to immunity that protects against subsequent symptomatic infections.

Parasitology Laboratory
Head: R. Haque

Collaboration was established by the Parasitology Laboratory with:

> the Community Health Division on a project entitled "Diarrhoea and ARI"

> the Clinical Sciences Division on a project entitled "Role of *E. histolytica* in dysentery"

> the Department of Medicine, University of Virginia, USA

> the Department of Parasitology, London School of Hygiene & Tropical Medicine on a European Commission project entitled "Field evaluation and further characterization of a pathogen-specific monoclonal antibody against *E. histolytica*."

Rapid diagnosis of pathogenic *Entamoeba histolytica*
PI: R. Haque
Funded by: SDC/WHO

Two enzyme-linked immunosorbent assay (ELISA) antigen detection tests were developed to detect specifically pathogenic *E. histolytica*, and both pathogenic *E. histolytica* and non-pathogenic *E. histolytica* (*E. dispar*). We are now evaluating these two ELISAs.

To date we have collected 96 stool samples positive for *E. histolytica* (pathogenic and non-pathogenic) either by microscopy or culture. Of the 96 stool samples, 67 gave a positive yield in culture, but we were able to characterize only 52 isolates by isoenzyme analysis (gold standard to validate the immunoassay). Of the 52 isolates, 22 were found to be pathogenic and 30 non-pathogenic strains of *E. histolytica* by isoenzyme analysis. For the 52 samples in which *E. histolytica* was speciated into pathogenic and non-pathogenic *E. histolytica* by isoenzyme analysis, the pathogenic *E. histolytica*-specific ELISA correctly identified 21/22 pathogenic *E. histolytica* and 28/30 non-pathogenic *E. histolytica* giving a sensitivity of 95% and a specificity of 93%. One hundred and six stool samples negative for *E. histolytica* by both microscopy and culture were also tested by the pathogenic *E. histolytica*-specific ELISA and were negative. Thus the pathogenic *E. histolytica*-specific ELISA is a sensitive and specific means to rapidly differentiate pathogenic *E. histolytica* from non-pathogenic *E. histolytica* (*E. dispar*) in stool.

Nutritional Biochemistry Laboratory

Head: M.A. Wahed

The laboratory has one Associate Scientist, one Scientific Officer, two Research Officers, one Laboratory Attendant, two Research Assistants and one Research Trainee. The major goals of the laboratory are: research support in the area of biochemistry and nutrition; research and development; collaboration; training and staff development; publications and participation in meetings.

The Laboratory was equipped with a new HPLC system for analysis of biological specimens for vitamin A content. A consultant helped develop the initial methods for training of the research officer, assigned to a project initiated in collaboration with the Johns Hopkins University, USA. Analysis of stored breast milk and serum samples is to be completed in 1995.

Relative dose response (RDR) and modified relative dose response (MRDR) tests to assess vitamin A status

PI: M.A. Wahed

Serum retinol, the modified relative dose response (MRDR) and the relative dose response (RDR) tests were carried out on 50 Bangladeshi children of 5-36 months of age. Most of the children were mildly to moderately malnourished but free of any apparent infections.

Children were orally supplemented with either 100,000 IU (under 1 year) or 200,000 IU (over 1 year) of vitamin A after performing both MRDR and RDR tests.

The final data suggested that the sensitivity of the MRDR test to detect low vitamin A stores among malnourished children was significantly lower than that of the RDR test. Thus, the MRDR test may be inadequate for use in populations where mild to moderate malnutrition is prevalent. The other indication is that in malnourished children, large oral supplements of vitamin A are either poorly absorbed and retained or are depleted in a relatively short period.

Other work in this laboratory includes collaboration with Dhaka Shishu Hospital concerning healthy Bangladeshi children for an extension of MRDR/RDR study. We are also participating in an external quality assessment run by the National Institute of Standards and Technology; in a study on vitamin A and carotene kinetics in healthy volunteers with the University of California-Davis; and in a study on vitamin A loss in urine with the University of Alabama at Birmingham (USA).

DEPARTMENT OF LABORATORY SERVICES

Head: M. Rahman

Animal Resources Branch

Head: K.A. Al-Mahmud

During 1994, the Animal Resources Branch provided direct support to the scientists of the Centre by performing animal experiments for 13 approved research protocols, 6 approved inter-departmental research activities, and exploratory experiments; by producing the required number of research animals of different species; and by extending its veterinary service through the Small Animal Clinic. The Branch undertook inter-institutional collaboration with the Institute of Public Health, IPGMR (Institute of Post Graduate Medicine & Research), BIRDEM (Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine & Metabolic Disorders), Livestock Research Institute, Dhaka University, Bangladesh Agricultural University and with some leading national and multinational pharmaceutical companies in Bangladesh. It also provided training for two persons in laboratory animal care at supervisory level.

Within this branch, there are three sections: Research and Treatment Section, which monitors the health of the animals, and conducts various research experiments; the Production and Nutrition Section, primarily responsible for breeding; and the Small Animal Clinic which treats small animals and a number of exotic pet birds.

Histopathology Laboratory

Head: M. Islam

The Histopathology Laboratory processes tissues

either from autopsy or biopsy specimens. Haematoxylin & Eosin stain is routinely used. At times, special stains are also applied for identification of pathogens.

Pathological and microbiological studies on primarily fatal cases of diarrhoeal illness and acute lower respiratory infection
PIs: M.M. Islam and A.K. Azad
Funded by: UNDP and WHO

Ten autopsies were conducted up to June 1994. The laboratory also supported two protocols from the Clinical Sciences Division. In one of the studies conducted in this laboratory, severity of colitis in fatal cases of shigellosis was found to be of higher grade in comparison to biopsies from adult cases with shigellosis.

Monthly clinico-pathological conferences were conducted at the ICDDR,B,'s Dhaka hospital, highlighting the interesting pathologic findings in selected cases.

Clinical Pathology Laboratory
Head: Md. A. Hossain

Under the Department of Laboratory Services, the activities of the Clinical Pathology Laboratory are: (1) diagnostic support for patient care activities for the Clinical Research and Service Centre (CRSC), Staff Clinic, Travellers' Clinic and referred cases from national hospitals and private clinics (paying users); (2) support to research protocols; (3) training of in-house staff, national and international fellows; (4) conduct research on diarrhoeal disease agents and methodological development; and (5) technical support to the specimens reception area.

The laboratory performed 117,433 tests on various parameters of 59,120 specimens of blood, serum, plasma, stool, urine, CSF, etc. producing 1,223,253 Workload Units (WLUs) in 23,712 work-hours with a general index of 51.59 WLUs per person-hour. The paying cases have increased by about 10% over the last year.

The most common parasites detected from stool samples were *Giardia*, *E. histolytica*, *E. nana*, *T. hominis* and *Cryptosporidium* spp. and those from blood were malarial parasites of both *P. vivax* and *P. falciparum*. In addition to routine blood tests, coaggulation tests, blood grouping and cross-matching and hepatitis markers were also done.

The Clinical Pathology Laboratory continues its participation with inter-laboratory comparison programme in the Quality Assurance Scheme (QAS) with the College of American Pathologists (CAP) in routine haematology, limited coagulation and clinical parasitology.

Although all evaluations have not yet been received, performance has been rated within the acceptable target value (95% confidence interval) with 100% in clinical parasitology.

Clinical Microbiology Laboratory
Head: M. Rahman

The Clinical Microbiology Laboratory provides diagnostic support by performing tests on specimens from patients of the Clinical Research and Service Centre, Staff Clinic, and Travellers' Clinic of ICDDR,B and outside patients (on payment). It also supports research, provides training to fellows from international and national institutes, provides in-house training and carries out methodological and applied (clinical) research.

The major accomplishment of the Clinical Microbiology Laboratory during 1994 was the development of an optimum culture method and rapid diagnostic techniques for the detection of *Vibrio cholerae* O139 from faecal samples. A thorough analysis of microbiological data was performed to study different isolates (pathogens) obtained during the past three years. Antimicrobial susceptibility patterns and changes among vibrios, *Salmonella typhi*, *Shigella*, blood and urinary isolates were studied. The mechanism of antimicrobial resistance was studied among *Shigella* isolates.

During 1994, the Clinical Microbiology Laboratory supported 26 research protocols and collaborated with the Institute of Post Graduate Medicine & Research (Prof. Moshiur Rahman, Department of Microbiology), University of Dhaka (Prof. Sirajul Islam Khan, Department of Microbiology) and University of Amsterdam

through research work on vibrios and *Shigella* by postgraduate students. New protocols were also adapted for optimum isolation and identification of new species/serotypes of vibrios, *Aeromonas* spp., *Shigella* and *Streptococcus* spp. Field support was also given to the Community Health Division's team of investigators to contain *V. cholerae* O1-associated diarrhoea (cholera) epidemic in different parts of the country. Sixty-eight (37.36%) of the 182 rectal swabs collected by the epidemic control team were positive for *V. cholerae* O1 and 14 (7.7%) were positive for *V. cholerae* O139.

Clinical Biochemistry Laboratory

Head: A.K. Chowdhury

The Clinical Biochemistry Laboratory gives diagnostic support to patient care activities of the Clinical Research and Services Centre (CRSC), Staff Clinic, and Travellers' Clinic and for referral cases from national hospitals and private clinics (paying users), supports research protocols, trains in-house staff, national and international fellows, conducts research on methodological development, undertakes quality assurance programme internally and externally, provides technical support for specimens reception area in collecting specimens/drawing blood and delivery of reports, and supports the Institute of Public Health (IPH).

The Laboratory performed 105,004 tests on various parameters of 27,358 specimens of blood, serum, plasma, stool, urine, cerebrospinal fluid, intravenous fluid, ORS, etc. The number of specimens and tests from paying cases were 14,063 and 52,476 respectively, a 13.18% increase over last year. The Laboratory continued its support to the Institute of Public Health for quality control of intravenous fluid (IVF) and ORS packets for electrolytes, glucose and pH. Deionized water was supplied for running the HPLC of IPH. Among the major accomplishments of 1994 was the purchase and installation of two un-interruptable power supply units to protect the sophisticated electronic equipment from damage due to frequent power failure. The laboratory provided a two-week training for a paramedic from the Centre for the Rehabilitation for the Paralyzed (CRP), Savar, Dhaka. Nineteen research protocols were supported during the period.

The Clinical Biochemistry Laboratory continued to participate in the International External Quality Assessment Scheme (EQAS) conducted by the Queen Elizabeth Hospital, Birmingham, U.K. The overall Mean Running Variance Index Scores (OMRVIS) of this laboratory varied between 50 and 66, which indicated a grade-I standard.

Support Services Branch

Managerial support

Head: M.A. Ali

The Laboratory Manager's Office coordinates the activities of the Support Services Branch which includes the Bio-Engineering Cell and the Logistic Support Branch. The objective of this branch is to assist in management of the Division by providing technical and logistic support services to the laboratories. As the Laboratory Manager is also the Safety Officer, he is constantly working to create a safe working environment for the Centre.

In 1994, forty major instruments required for various laboratories of the Division, were selected for acquisition. We ordered instruments and equipment, including Chemistry Analyzer, Ultracentrifuge, Scintillation Counter, and Incinerator. Most have arrived and have been installed.

The new training laboratory was furnished with working tables, chairs and was provided gas and electric lines according to plan.

The Occupational Safety and Environmental Protection Programme (OSEPP) of the Centre was established in 1993. The major objectives are the maintenance of safety of its staff at their workplace, and protection of the environment. The Safety Officer was made the Secretary of the OSEPP. The other members have been drawn from different areas of the Centre to include environmental scientists, social scientists, laboratory scientists, engineers, and clinicians. The major activity of the Committee during 1994 was to develop basic safety rules for the Centre,

dissemination of the rules, and to ensure that people observe those rules.

Bio-Engineering Cell

Head: S.S. Huq

The Bio-Engineering Cell (BEC) plays an important role in all LSD activities. The responsibilities of BEC are: installation of new equipment; routine maintenance of all analytical and clinical equipment; calibration of all equipment to the desired level of performance; and modification of equipment in case of non-availability of spares or major breakdown were accomplished.

In May, there was a sudden total breakdown of the electrical network of the hospital and laboratories. There were invaluable samples in the freezers of LSD which were at risk of total destruction. The Bio-Engineering Cell was able to give makeshift electrical supply to 35 freezers within two hours; thus all samples were saved.

With the Sasakawa Foundation grant and funds from some other projects, 35 new pieces of equipment were installed in the various units of LSD. The installation and addition of this equipment gave LSD the opportunity to increase its research capability in quality and quantity.

Logistics Support Branch

Manager: Q.S. Ahmad

The Logistic Support Branch comprises two sections, namely: Media Preparation-Decontamination and Bacterial Stock Culture Collection. During 1994, this branch provided technical support to 25 research projects and to the clinical laboratories at Dhaka and Matlab. It supplied distilled water and various kinds of culture media required for the identification of

A delegation from the Royal College of Defense Studies visited the Centre

Asem Ansari

bacterial pathogens. During 1994, the media section prepared 201,800 culture plates and 1,278 litres of different culture broths as required by various research projects. Quality control tests were performed on the most important media.

We procured a new Virtis Lyophilizer of 25 litre capacity to increase the productivity of our Lyophilizing Section. This new machine has a built-in shell freezing bath to process bulk samples.

The Logistic Support Branch provided support to Dhaka University and Jahangirnagar University by lyophilizing research specimens. We also took an active part in International Training Courses on Diarrhoeal Disease Agents held at ICDDR,B in 1994.

Matlab Field Laboratory

Head: Q.S. Ahmed

The Matlab Field Laboratory is basically designed to provide support to the Matlab Hospital and other field-based research projects. The Laboratory is divided into Clinical Microbiology, Biochemistry and Pathology. Facilities are available to provide a number of individual tests, such as culture and sensitivity, examination of stool/urine, serum electrolyte, glucose, urea, TCDC, ESR, cross-match, Widal, and pregnancy test.

During the year, the Microbiology Section performed 12,627 tests which included culture, sensitivity, and dark-field examination of *V. cholerae*. In the Clinical Pathology and Haematology Section, we performed about 13,948 tests. Environmental samples were also tested for coliforms and faecal coliforms.

Archives Unit

Head: M.A. Malek

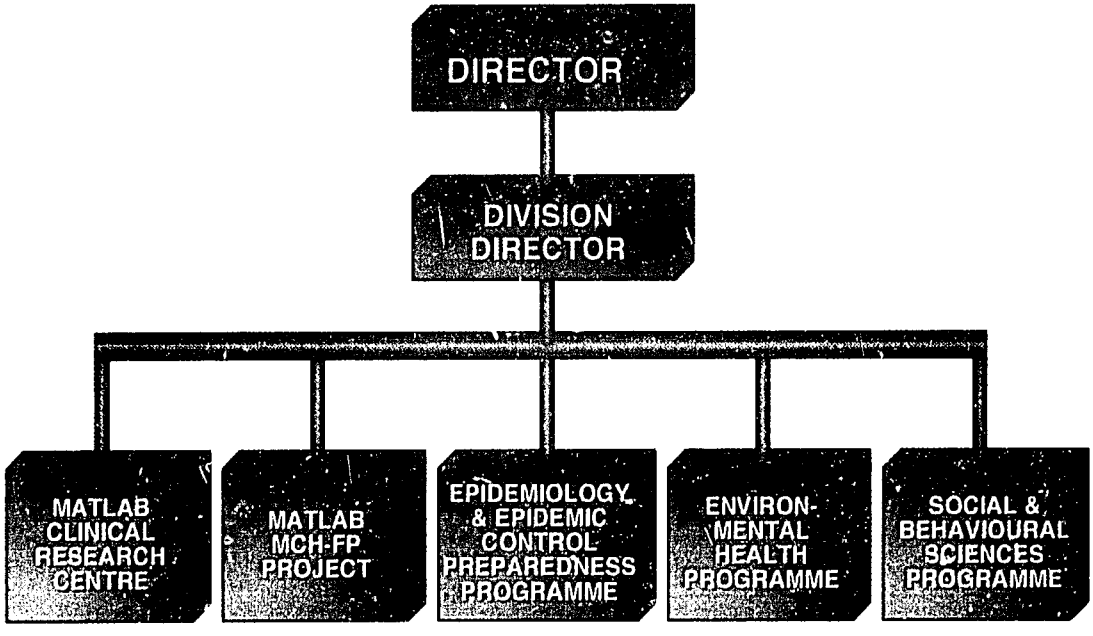
The Archives Unit, using archived data for research purposes and future reference, acts as a data bank for scientists/researchers at home and abroad. For this purpose, the Unit provides routine support by computerizing data for the treatment centres and laboratories (Dhaka and Matlab), performing data entry/verification, coding, editing, data cleaning and data processing. The Unit produces monthly blood culture reports, *Shigella* sensitivity reports, and financial recovery reports for the Clinical Laboratory, Treatment Centre, Travellers' Clinic, Staff Clinic and private patients. It also provides support for producing monthly financial reports for media preparation. It provides a weekly surveillance report (with graphical representation) for the Government of Bangladesh on diarrhoea pathogens isolated from the stool/rectal swab samples collected from the surveillance patients attending the Dhaka hospital. This unit also provides support for data analysis, data management activities and research support to the scientists of the Laboratory Sciences Division. In 1994, the Unit processed 139,494 records for Pathology, Microbiology, Clinical, Biochemistry and others for both Dhaka and Matlab treatment centres. A database of 7,484,000 records has already been developed. During the year, the Archives Unit developed a database for computerization of specimen reception activities and delivery of reports for the outside patients for better management and quick service. It also produced monthly *Shigella* sensitivity reports, blood culture reports, organism isolation reports, Staff Clinic reports and yearly reports for Microbiology, Clinical Biochemistry, Pathology and Miscellaneous (including distribution of sensitivity pattern, organism isolation, specimen-wise number of tests and costs). Fifty-two weekly surveillance reports were produced. About 25 analytical and query reports were prepared in response to specific requests from scientists.

Outpatient Service Project

Head: M. Rahman

The specimens reception section is involved in receiving specimens from: Clinical Research and Service Centre (CRSC), Dhaka; Travellers' Clinic; Staff Clinic; and paying users. The Section handled a total of 121,990 specimens and more than 15,000 blood collections were done in this reception area in 1994. The specimen reception area purchased a computer so that the operating system could be computerized for registration of patients, writing of investigation report, cash handling, and reports delivery.

COMMUNITY HEALTH DIVISION



COMMUNITY HEALTH DIVISION

Division Director: R. Bradley Sack[a]

Divisional Highlights

- In July 1994, the worst cholera epidemic in recent history occurred among the Rwandan refugees in Goma, eastern Zaire. This resulted in thousands of deaths. In response to a USAID call for assistance, an eight-member ICDDR,B team, including three members from the Epidemic Control Preparedness Programme (ECPP), spent two weeks in Goma conducting epidemiological and laboratory investigations, rendering patient care and providing technical advice to other health care providers.

- Epidemiologists and physicians of ECPP continued to visit areas of Bangladesh affected by outbreaks of cholera, defining the epidemic caused by the newly recognized strain of *Vibrio cholerae* O139 Bengal. Though *V. cholerae* O1 continues to be the predominant strain in the country, the 0139 Bengal seems to be gaining ground in the southern coastal areas.

- The Urban Health Extension Project was shifted to the Population and Family Planning Division.

- The Social and Behavioural Sciences Programme is well underway with the recruitment of nine new staff.

The Community Health Division (CHD) witnessed several changes in the position of Division Director during the year. Dr. R. Bradley Sack completed his assignment in June. Throughout the remainder of the year, Dr. O. Massee Bateman and Dr. K.M.A. Aziz shared the responsibility for this post.

Based on sound epidemiological, sociological, and clinical data, the Division attempts to develop, test, and implement cost-effective, sustainable interventions (prevention and treatment) which will improve the health of children under 5 years of age, improve access to and choice of family planning methods, and improve the reproductive health of women of child-bearing age.

The CHD is the largest Division at the Centre with a total of 450 employees and trainees in 1994. It consists of investigators whose primary interests are in studies of infectious diseases at the community level, especially diarrhoeal, acute respiratory, and nutrition-related illnesses, reproductive health, and family planning. More specifically these interests include: environmental interventions, epidemiologic patterns of illness, transmission of infectious agents, delivery of health care, and prevention of illness through education, behaviour modification, and vaccines. The research and service activities take place in both rural (Matlab and Mirzapur) and urban (Dhaka city) areas, mostly among persons of low socioeconomic status.

There are currently 11 international staff, including 1 postgraduate student, 27 national level scientists, 3 national officers and 409 regular and other staff, including 125 community health workers. The Division has 5 Scientific Programmes and 2 Scientific Interest Groups, all of which interact in divisional activities of research, service, training, and administration. The 5 programmes are: (1) Matlab Clinical Research Centre, (2) the Matlab Maternal and Child Health and Family Planning Programme (MCH/FP), (3) Epidemiology, (4) Environmental Health Programme, and (5) Social and Behavioural Sciences Programme. The two Scientific Interest Groups are: Social Science and Health Systems Research. There are many projects within this framework that deal with specific research topics.

[a]O. Massee Bateman (July-September)
K.M.A. Aziz (October-December)

The major achievements of 1994 are reported here in brief. More details are given by the various units of the Community Health Division:

> Proctor and Gamble allocated $50,000 for a clinical trial on the prevention of persistent diarrhoea using bismuth sub-salycilate. This study will begin when drugs are available.

> Partial funding for the family planning activities of the MCH-FP Programme was assured by the Japanese Government.

> The joint BRAC-ICDDR,B research project completed the report of the baseline survey in May 1994.

> The study on the transplacental transfer of antibodies to *Streptococcus pneumoniae* from immunized mothers to their newborn children showed that antibodies were effectively transferred. The median half-life of the antibodies has been placed at 35 days with an appreciable amount remaining at 14 weeks. These findings will have policy implications for future vaccination programmes.

> The Community Development Project, in Chakaria thana of Chittagong division, began field activities in June. The project is funded by the Swiss Red Cross.

> A new umbrella protocol entitled "Action research and impact studies on community water, sanitation and hygiene education interventions in rural areas" has been prepared. This allows ICDDR,B-GoB-Donor agencies' collaborative research on water and sanitation programmes in rural and crowded urban areas.

> A study on hand-washing practices indicated that washing hands with soil, ash, or soap all have similar potentials for cleaning bacteria on the hands.

Matlab Clinical Research Centre

Coordinator: Md. Yunus

The Matlab Clinical Research Centre includes scientists and physicians whose primary involvement is in the Matlab Diarrhoea Treatment Centre (DTC). This rural DTC is located 55 km south-east of Dhaka and has 70 beds. Matlab DTC and the 3 Community-operated Treatment Centres located at Nayergaon, Kalirbazar and Shataki provide free treatment services to diarrhoeal patients of Matlab and surrounding areas. Matlab DTC also supports many ongoing community-based studies as well as demographic surveillance activities.

Matlab Diarrhoea Treatment Centre

Head: Md. Yunus
Funded by: Core funds

During the year, 16,352 patients were treated at the Matlab DTC. Of these, 22% came from within the Demographic Surveillance System (DSS) area and 78% from outside. The case fatality rate was 0.66%. This year, epidemics of cholera were caused mainly by *V. cholerae* O1. The isolation of new serogroup *V. cholerae* O139 sharply declined during the year from that of 1994. Another 5,436 patients with diarrhoea received treatment at the 3 Community-operated Treatment Centres run by volunteers trained and supported by the Matlab DTC. Only 13 patients died in these centres, yielding a case fatality rate of 0.24%.

All 3,610 patients who were residents of the Matlab DSS area had a rectal swab culture and the main pathogens isolated were: *V. cholerae* O1 (17%), *Shigella* sp. (9%) and *V. cholerae* O139 (4%) as presented in the table on page 37. Figure 1 depicts the isolation rate of these organisms for the last 8 years. The most common species of *Shigella* isolated during 1994 was *S. dysenteriae* type 1 (52%) followed by *S. flexneri* (42%). Figure 2 presents the resistance pattern of *Shigella* isolates to common antibiotics over the last 6

years. The important change was the decrease over the last year in the resistance to mecillinam of all *Shigella* species.

The main ova and parasites in the microscopic examination of 2,535 stool samples were: *Ascaris lumbricoides* (24%), *Trichuris trichiura* (10%), hookworms (3%), *Giardia lamblia* (3%) and *Entamoeba histolytica* (1%).

Identifying the barriers to timely treatment of ARI

PIs: K. Zaman, S. Zeitlyn, J. Chakraborty and A. de Francisco
Funded by: USAID

The objectives of the study were to identify major modifiable barriers and constraints to timely

Aetiological agents identified in patients from the Matlab DSS area: Matlab Diarrhoea Treatment Centre, 1994

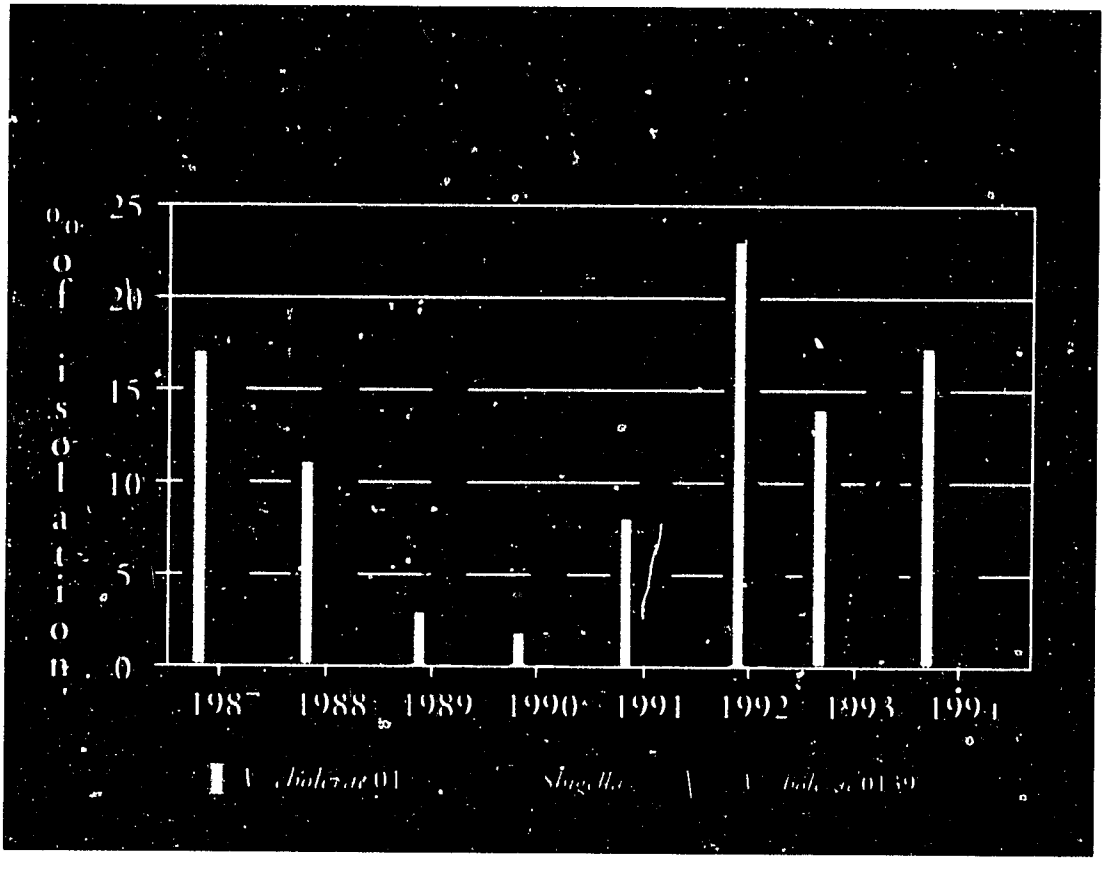
Month	No. of patients	DSS area patients	*V. cholerae* O1	*V. cholerae* O139	*Shigella*	*Salmonella*
January	890	218	8 (4)	5 (2)	20 (9)	1 (<1)
February	569	159	12 (8)	1 (1)	6 (4)	2 (1)
March	650	195	7 (4)	5 (3)	6 (3)	3 (2)
April	1405	334	18 (5)	17 (5)	21 (6)	3 (1)
May	1090	294	41 (14)	4 (1)	21 (7)	-
June	990	276	26 (9)	3 (1)	26 (9)	-
July	1094	322	20 (6)	10 (3)	45 (14)	1 (<1)
August	1708	460	81 (18)	5 (1)	31 (7)	3 (1)
September	2187	465	140 (30)	8 (2)	32 (7)	2 (<1)
October	2725	331	121 (37)	15 (5)	32 (10)	2 (1)
November	2088	333	107 (32)	44 (13)	34 (10)	1 (<1)
December	956	223	37 (17)	23 (10)	37 (17)	-
Total	16,352	3,610	618 (17)	140 (4)	311 (9)	18 (<1)

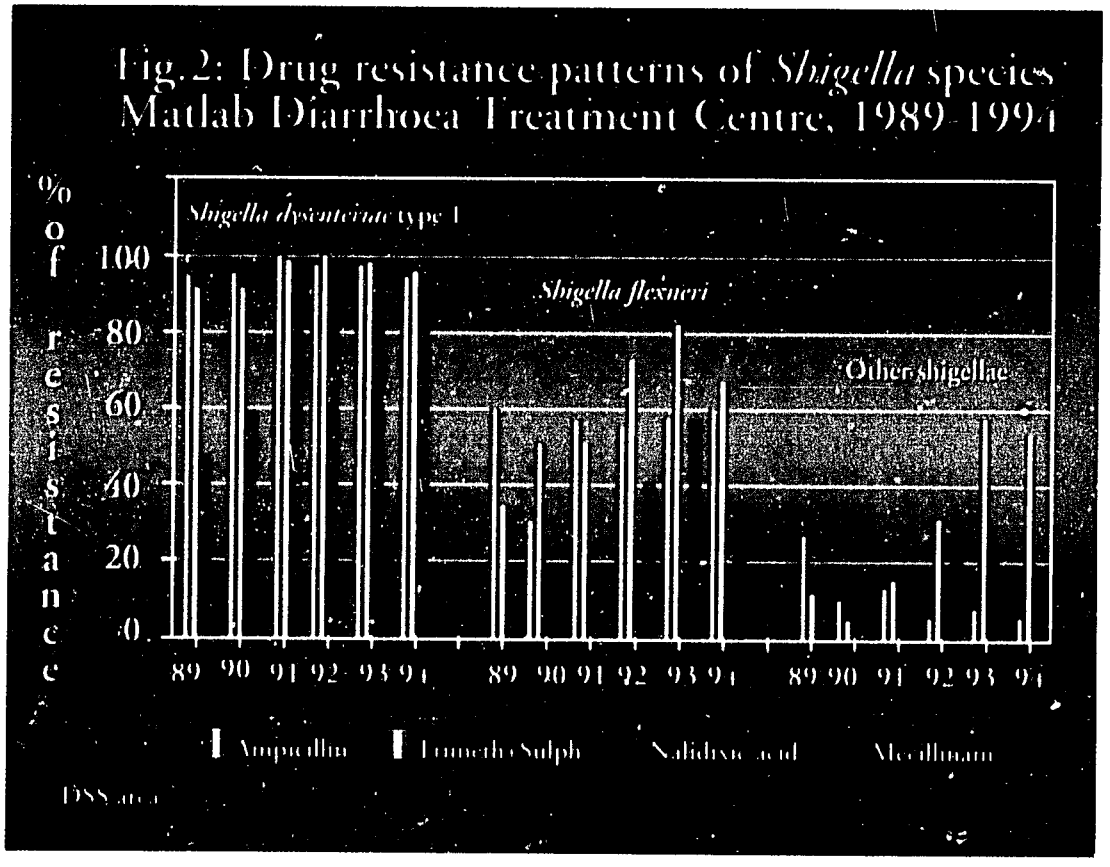
Figures in parentheses are percentages of DSS area patients

Graham Wright

Asem Ansari

Home visits by health workers are regular features of the health care system





recognition and effective treatment seeking by parents of under-five children with acute respiratory infections (ARI). The study was conducted in one of the Maternal and Child Health and Family Planning (MCH-FP) blocks at Matlab. Community Health Workers identified children with moderate or severe respiratory infections through routine surveillance. Two hundred children were recruited in three groups: parents or caretakers who sought no treatment for ARI, those who received treatment from ICDDR,B and those who received treatment from any other sources. Field collection of data has been completed, and analysis is proceeding.

Quantitative and qualitative methods will be used for assessing barriers to the timely treatment of ARI. The results of the study will help in the development of recommendations to promote appropriate health service utilization by parents of children below 5 years of age.

Matlab Maternal and Child Health and Family Planning (MCH-FP) Programme and Record-keeping System (RKS)

PIs: A. de Francisco, J. Chakraborty and S.A. Khan

Funded by: Japan and Core funds

The overall goal of the Matlab MCH-FP Programme is fertility decline, and decreased mortality and morbidity of women of child-bearing age and children under five years of age in rural Bangladesh. Project activities directed toward this goal include provision of services and training, research focused on identification of successful methods of service delivery, and related descriptive research. The main research objectives are (a) to test and quantify the effectiveness of health and family planning programme interventions in decreasing fertility and morbidity and mortality prior to extension in a broader national context; and (b) to conduct descriptive, epidemiologic and operations research.

Family Planning Activities

The Programme achieved a contraceptive prevalence rate (CPR) of 64%, which is among the highest ever reported in rural Bangladesh and approximately one-third higher than the national average. The total fertility rate has been reduced to below 3 in the area. This has been achieved by the Community Health Workers (CHWs) through training, good relations with the community and by offering contraceptives to eligible couples on a cafeteria approach', in which clients are offered a wide range of choice from condoms to Copper-T (IUD), at their homes.

By the end of the year, 11,843 women were contraceptive users, among whom 6,008 (50%) were using injectable contraceptives (DMPA) and 2,951 (25%) oral contraceptives.

Current service-oriented research activities include the screening and treatment of women using contraception for side-effects. The Programme carries out between 150 and 200 tubectomies and a few vasectomies per year. Long-term observation for possible complications through household visits is carried out by the Programme.

Mother and Child Survival Activities

During the year, 2,523 deliveries were recorded. Antenatal care was provided by CHWs on 7,569 occasions, and by nurse-midwives on 1,426. Post-natal care was performed on 421 occasions by nurse-midwives. On 471 occasions (19%), nurse-midwifes were called to attend a delivery. One hundred and nineteen complicated deliveries were referred to the Matlab MCH-FP Maternity Care Ward.

One hundred and ninety-four women were admitted to the Matlab Clinical Research Centre (CRC) and delivered by our staff, and 95 females were admitted for other reasons.

Nine hundred and fifty-three children below five years of age were admitted to the hospital during 1994, among whom 552 (58%) were suffering from acute lower respiratory tract infections (ALRI). Similarly, the out-patient department of the CRC and the four Sub-centres saw 5,507 infants and 10,452 children of 1 to 4 years of age. Sixty-five children were admitted to the Nutrition Rehabilitation Unit as their mid-upper arm circumference was below 110 mm.

Immunization data for the year showed that 95.1% of the infants were immunized with BCG, 80.4% with DPTP III, 94.1% of children of 9 to 23 months of age against measles and 97.4% of the women of reproductive age with two more doses of tetanus toxoid. Over 13,687 capsules of vitamin A were distributed during the year in the appropriate dosage every six months, reaching a coverage of 97% among children below 5 years of age.

During the year, 229,734 locally-made ORS packets were distributed and 3,084 safe delivery kits were produced and distributed to pregnant women in the intervention area.

Record-keeping System

Since 1990, the Project has been using a computerized Record-keeping System which

provides feedback to the field workers within one month of data collection for improved service delivery and supervision. Women and children are now targeted more efficiently by CHWs. This translates into better organization of CHWs' activities resulting from the targeting of visits to the households, thus increasing the quality of care by increasing the time contact between health service providers and recipients. Information on health system delivery is available from computerized data files for analysis and monitoring of programme activities.

Preparations were carried out during 1994 for the eventual transfer of the Record-keeping System to the Matlab MCH-FP Programme.

Vitamin A supplementation to mothers (Retibeta study)
PIs: A. Rice, A.de Francisco and J. Chakraborty
Funded by: USAID

Field activities began in Matlab for a community-based study designed to prospectively examine the impact of maternal vitamin A supplementation on the vitamin A status of mothers and their breast-fed infants. A cohort of 220 mothers began supplementation at 2 weeks postpartum, receiving either a one-time dose of 200,000 IU retinol or daily doses of beta-carotene at dietary levels (7.8 mg) or placebos. Supplementation and follow-up of the cohort will be continued until nine months postpartum.

Reproductive tract infections in Matlab
PIs: S. Hawkes, A. de Francisco
and J. Chakraborty
Funded by: ODA

Reproductive tract infections (RTIs) encompass a broad range of organisms (including those that are sexually transmissible, STDs), the majority of which have a significant impact on the health of adults if left untreated. Non-treatment of RTIs in pregnant women can result in foetal loss, neonatal morbidity and mortality, and congenital infections (particularly severe in the case of syphilis). The presence of STDs is also known to be associated with an increased risk of HIV transmission. Thus, at both individual and the public health level these infections are an important cause of both morbidity and mortality. With this background in mind, ICDDR,B has initiated a study to look at RTIs in Matlab. This project will examine the issues of treatment-seeking behaviour in relation to RTIs and will investigate risk factors for infection. The results of these studies will affect policy decisions concerning the provision of RTI screening and management at the primary health care level, and the cost-effectiveness of eye prophylaxis in newborns.

Measles maternal antibody decay in infants
PIs: A. de Francisco, A.J. Hall, L. Unicomb,
J. Chakraborty, R. Begum and Md. Yunus
Funded by: USAID

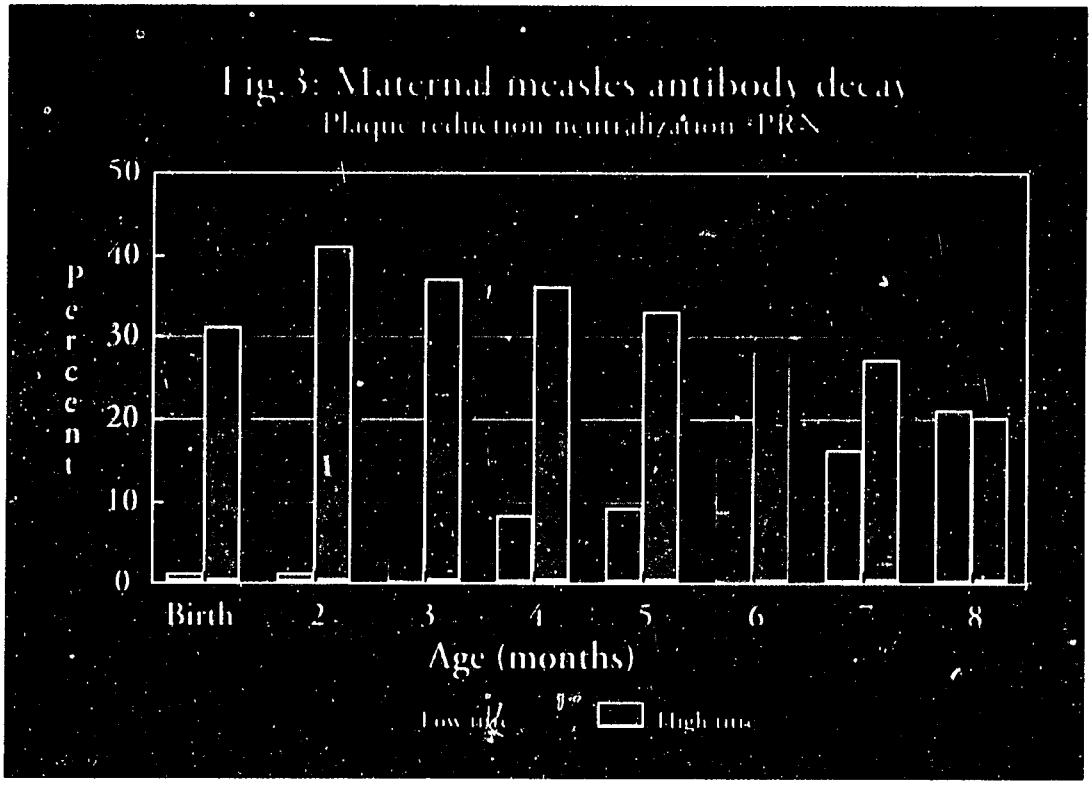
Earlier reports emerging from the Measles Surveillance System in place in Matlab showed that a high proportion of measles cases occured in children below nine months of age, the age recommended for measles immunization. A study was conducted encompassing the Community Health, the Laboratory Sciences and the Population and Family Planning Divisions to evaluate the protection conferred by mothers to infants in the intervention area.

A cross-sectional survey on the infant population was carried out. We reported in the 1993 Annual Report preliminary results of maternal antibodies in infants tests by an ELISA. In that report, it was clear that only 20% of the infants at 4 months and 10% at 6 months of age still had maternal antibodies present, raising the possibility of vaccinating well before 9 months of age. Figure 3 shows the results of a more sensitive diagnostic test (PRN).

Even though the antibody decays faster with age, the results are more encouraging than those of the ELISA. However, there is still a high proportion of infants unprotected from 4 months onward. Future research will evaluate sero-conversion to Schwarz vaccine at different ages.

Control of acute lower respiratory infections (ALRI) through case finding and management
PIs: A. de Francisco and J. Chakraborty
Funded by: Core funds

ALRI is an important cause of death of children below five years of age in Matlab. The ALRI



intervention was initiated in 1988 in Matlab with the goal of decreasing morbidity and mortality of children suffering from pneumonia.

The Programme reported a significant reduction on ALRI-specific mortality (32%) after the intervention through systematic detection and treatment of pneumonia cases by CHWs.

A recent analysis of the ALRI intervention showed that passive case detection by the CHWs (when parents of children with acute ALRI cases report to the CHW's home for treatment) accounted for about 75% of all cases detected at the home level.

Similarly, self-referred cases (no contact with the CHWs but direct contact with higher health service levels) accounted for 14% of all cases. This group was made up of a significantly higher proportion of infants, of severe cases, and of females. These findings indicate that active participation of the families is an important component of a successful ALRI control programme.

Wheezing-associated respiratory disorders (WARD) and hypoxaemia in hospitalized children under five years of age in rural Bangladesh

PIs: S. Erny, A. de Francisco, Md. Yunus, J. Chakraborty, R. Shaheen, L. Unicomb, G Podder, K. Gyr and R.B. Sack
Funded by: SDC

This study is an evaluation of the current WHO ARI treatment guidelines used worldwide. Data on the clinical epidemiology (including aetiology) of acute respiratory infections (ARI) are collected, with a special focus on diagnoses other than pneumonia. The results from this research will help health planners to decide what priority the introduction or strengthening of oxygen therapy, and other interventions besides antibiotic therapy, should get within programmes for the reduction of mortality related to ARI in infants and young children in developing countries.

Safe motherhood

PIs: A. de Francisco, A.M. Vanneste and J. Chakraborty

Funded by: Ford Foundation and Core funds

The Maternity Care Programme, an extension of the MCH-FP Programme, was initiated as a pilot study for the Bangladesh National Safe Motherhood Programme. With a maternal mortality ratio (MMR) between 5 and 6/1000 live-births, one of the highest in the region, Bangladesh needs to expand maternal and neonatal services and improve their quality.

Starting in 1987, trained midwives and paramedics were posted at village health outposts, backed up by 3 female medical physicians at a central maternity clinic in Matlab town. If a woman needed a Caesarian section or a blood transfusion, the programme provided transport to the district hospital. Midwives and paramedics train Community Health Workers (CHWs) and traditional birth attendants (TBAs), make antenatal visits, perform deliveries and do as many postnatal visits as possible. From 1991 on, the 80 CHWs visited about 80% of all pregnant women, every month from the fifth month of pregnancy onward (Fig. 4). They notified the midwives about women at risk (Fig. 5). 1994 data are under review.

In evaluating the Matlab Maternity Care Programme, two key issues can be identified as major constraints to a significant reduction in maternal and perinatal mortality: first, the cost and the quality of comprehensive emergency obstetric care; and second, the difficulty in securing acceptance for referral when a life-threatening complication arises. These constraints reinforce each other. In Matlab, despite the high coverage in antenatal care, 79% of all maternal deaths did not call the midwife prior to death. As in many programmes, people most in need of care do not use available services.

In June 1993, meetings with high-risk families were introduced to prepare, physically and mentally, not only women but also other decision-makers, for an eventual referral in case of complication. Since mid-1993, a referral form has been used for checking the number of women advised for referral, acceptance and refusal of referral advice. The referral form also intends to give information on the health status of the client at different levels of referral, the time lag, the interventions and outcomes at different stages. The response from the government hospital in Chandpur on the referral form still needs improvement despite regular visits from ICDDR,B. Data have been entered into a computer, and an evaluation is underway.

Refusal for referral

A recent investigation into refusal for referral revealed, contrary to our previous understanding, that most women themselves took the decision. To refuse referral probably does not need the approval of other members of the family since no inconvenience is involved for them. This is presumably not the case when the woman chooses to be referred. Several women mentioned that they could not go to Matlab because their husbands were not at home to give permission.

Although retrospectively interviewed, women recognized that their life and that of the unborn child were in danger at the moment they were referred. They felt that there was no reason for referral since they felt it could not avert death. This clearly shows the lack of confidence women have in the referral when a pregnancy-related complication arises. None of the women who refused referral expressed this toward ICDDR,B facilities, however.

Maternal and neonatal mortality

Fauveau has shown a decline in direct obstetric deaths for the period 1987-1989 in the Matlab Maternity Care intervention area. Despite the presence of the maternity care programme in the MCH-FP area, there was no significant difference in the maternal mortality ratio between the MCH-FP area and the comparison area during this period. It is interesting to note that there has been a small but significant difference in the neonatal mortality rate between the MCH-FP area and the comparison area as shown in figure 6.

As maternal mortality appears to have been falling in the MCH-FP area since 1991, efforts are underway to review the cause of death information using the methodology of the previous studies.

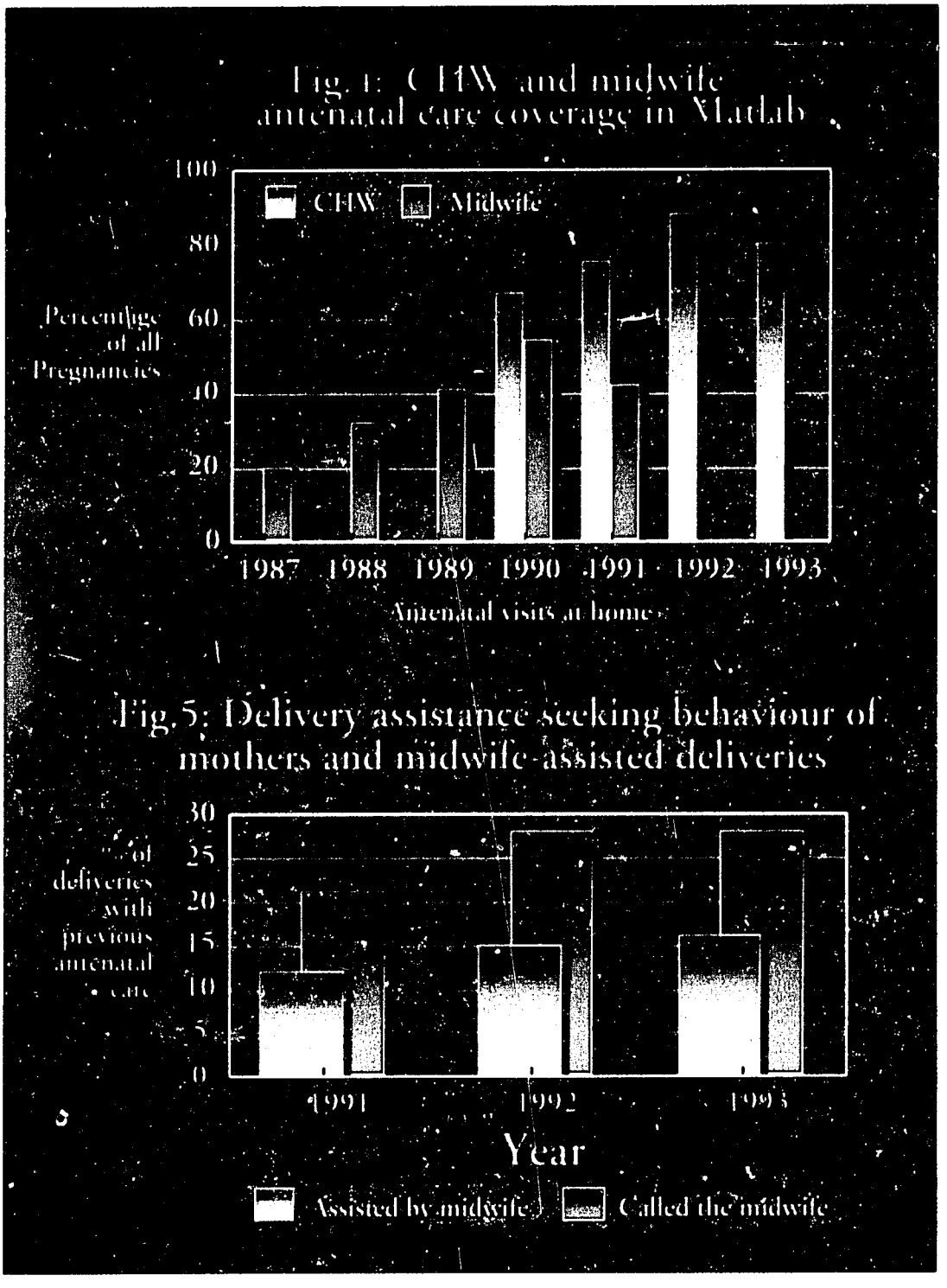
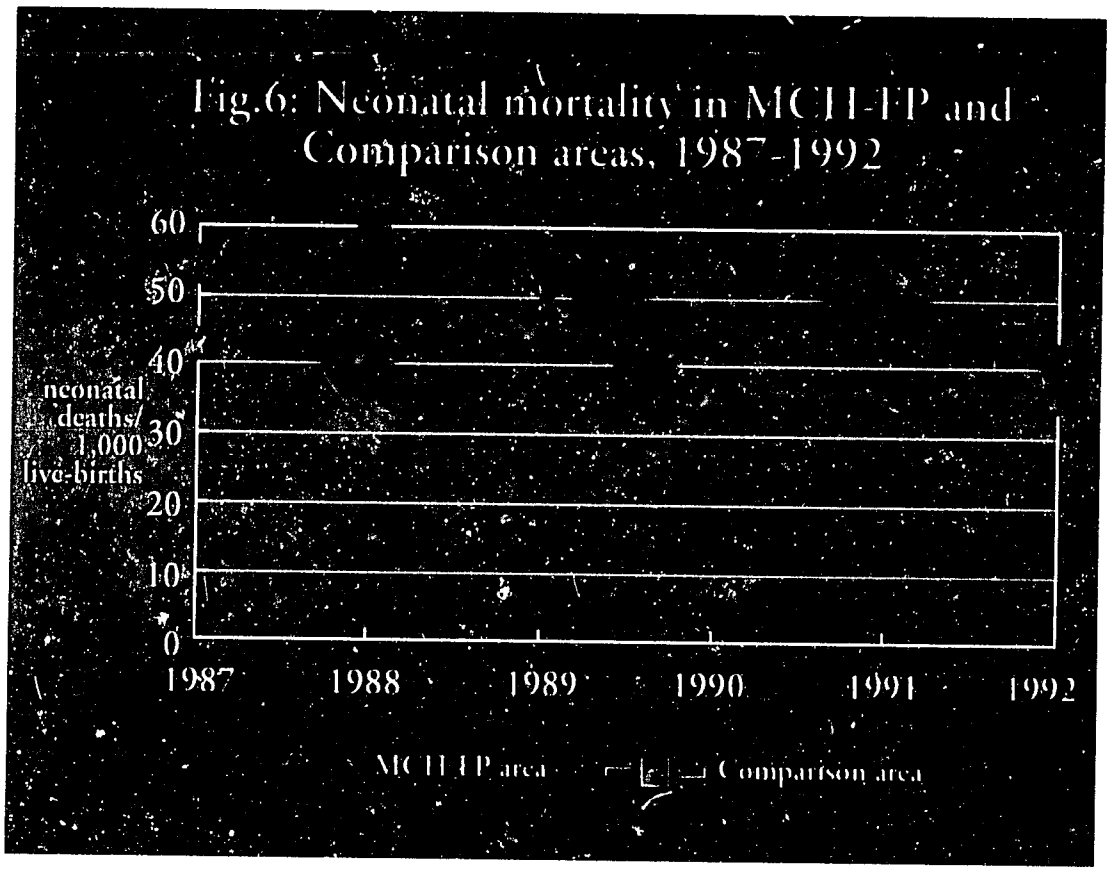


Fig. 4: CHW and midwife antenatal care coverage in Matlab
100
80
60
40
20
0
Percentage of all Pregnancies
CHW
Midwife
1987
1988
1989
1990
1991
1992
1993
Antenatal visits at home
Fig. 5: Delivery assistance seeking behaviour of mothers and midwife-assisted deliveries
30
25
20
15
10
5
0
% of deliveries with previous antenatal care
1991
1992
1993
Year
Assisted by midwife
Called the midwife



This smile is the ultimate target of all our efforts

Graham Wright

Asem Ansari

Nutrition Surveillance System
PIs: A. de Francisco and J. Chakraborty
Funded by: Helen Keller International

The Project is currently collaborating with Helen Keller International (HKI) in a country-wide nutrition surveillance system in disaster-prone areas. Reports on anthropometrical measurements (weight, height and mid-upper arm circumference (MUAC)) in groups of 500 infants both in the treatment and comparison areas are produced every three months by HKI.

Nutrition rehabilitation in Matlab
PIs: A. de Francisco and J. Chakraborty
Funded by: Core funds

Measurement of MUAC is performed every three months for all children under five years of age in the Matlab MCH-FP intervention area. If the MUAC is between 120 and 110 mm, the child is closely monitored. However, if it is below 110 mm, the child is referred to the Nutrition Rehabilitation Unit (NRU) of the MCH-FP Programme. The NRU was initiated in April 1986 for the treatment of severely malnourished children. Recent analysis showed that children admitted were severely malnourished. During the rehabilitation period, children gain weight and MUAC significantly. However, after discharge these children are still well below the parameters of children in the community as can be seen in figure 7.

Clustering pattern of cholera-like watery diarrhoea cases in Matlab-1989
PIs: J. Myaux, M. Ali, A. Felsenstein, J. Chakraborty and A. de Francisco
Funded by: BADC

To represent the spatial distribution of acute watery diarrhoea episodes in children aged less than five years from Matlab intervention area, all cases reported by the community workers in 1989 were mapped (page 49). Among the 14,885 children, 520 cases of acute watery diarrhoea were recorded in 298 *baris* with a point prevalence of 3.4%. A specific non-parametric test for heterogeneous populations revealed a strong spatial clustering pattern ($p<0.001$). The risk areas are significantly associated with a lower education level in the households.

These data may suggest environmental differences between high and low-risk areas for diarrhoeal diseases. Such a pattern may have to be considered for designing prospective studies or vaccine trials using smaller samples. Further efforts need to be undertaken to assess potential bias and to explain the specific epidemiological pattern of cholera in Matlab.

The effect of maternally-derived polio antibodies on the serologic response to oral polio vaccine in young infants
PIs: J. Myaux, L. Unicomb, R. Besser, A. Uzma, A. Islam, J. Modlin and M. Santosham
Funded by: BADC

A cohort study on the effect of simple diarrhoea on the serological response to oral polio vaccine, in which 391 infants from Dhaka slum areas were enrolled, was implemented earlier. After showing a significant 30% reduction due to simple diarrhoea in sero-conversion rates on poliovirus type 2 and 3 after the first dose, the authors compared the sero-conversion rates against the level of passively acquired antibodies from the mothers. The analyses controlled for the presence of diarrhoea at the time of vaccination. Among the infants with low maternal antibody titre, sero-conversion rates after the first dose ranged from 50% to 61% according to the serotype, against 24% to 46% in the infants with high maternal antibodies ($p<0.01$). The difference remains significant after full vaccination, with sero-conversion rates between 80% and 85% against 62% and 81%.

Matlab Staff Clinic

Head: Md. Yunus
Funded by: Core funds

The Matlab Staff Clinic provides health care services to staff and their entitled dependents. Four thousand five hundred and sixty-four patients were seen as outpatients by the clinic and another 89 were hospitalized. Vaccinations against

diphtheria, whooping cough, tetanus, poliomyelitis, measles, and tuberculosis were also provided.

Epidemiology Programme and the Epidemic Control Preparedness Programme (ECPP)

Head: A.K.M. Siddique

Special Assignment

In July 1994, the worst cholera epidemic in recent history broke out among the Rwandan refugees in Goma, eastern Zaire. About 12,000 refugees died during a three-week period in the epidemic. ICDDR,B dispatched a medical team to Goma which included a medical anthropologist from the Social Science Interest Group, two physician epidemiologists from ECPP and Dr A.K.M. Siddique, head of the ECPP, as the team leader.

During their two-week stay the team, in collaboration with UNHCR, UNICEF and the Ministry of Health, Zaire, conducted an epidemiological assessment of the situation, rendered patient care by operating a temporary treatment centre, and provided technical advice on case management of cholera and shigellosis to other health workers involved in medical relief activities in Goma.

Scientific Achievement

A scientific paper, describing the epidemiological findings of the ECPP relating to the *V. cholerae* O139 epidemic in Bangladesh entitled "Emergence of a new epidemic strain of *Vibrio cholerae* in Bangladesh: an epidemiological study" was published.

Epidemic Control Preparedness Programme (ECPP)

PI: A.K.M. Siddique
Funded by: NORAD

Cholera epidemics in 1994

After the violent epidemic due to *V. cholerae* O139 in the previous year, which rapidly spread through most parts of the country except the north-western districts, 1994 was a relatively quiet cholera year. However, outbreaks of diarrhoea in epidemic scale were reported from 12 southern and 24 northern districts. During the year, the Government health services reported over 110,000 diarrhoea cases and nearly 800 deaths.

Investigations and intervention by ECPP

The ECPP, in collaboration with the Government health services of Bangladesh, conducted investigations of the outbreaks in eight southern and two northern districts during the dry season (January-June), and in 11 northern districts during the wet season (July-November). The ECPP teams visited 57 thanas of 21 affected districts, and in collaboration with the local health staff identified and treated 1,164 acute diarrhoea patients.

For laboratory investigations of the pathogens, the ECPP physicians collected specimens from 172 suspected cholera patients, which were cultured and the antibiotic sensitivity patterns tested. Results indicated a change in the sensitivity patterns; in the northern areas, *V. cholerae* O1 which was resistant to tetracycline until last year, is now mostly (>80%) sensitive to the drug. It is still resistant to the drug in the southern areas. The sensitivity patterns of O139 remained unchanged.

Status of *V. cholerae* O139 in 1994

Nearly two years after the initial outbreak, significant differences in distribution of *V. cholerae* were observed at different geographical locations of Bangladesh.

In the southern coastal region, *V. cholerae* O139, which had completely displaced both biotypes of *V. cholerae* O1 (Classical and El Tor) in 1993, continued to dominate the epidemics in 1994. Between January and March 1994, *V. cholerae* O139 strains accounted for most (79%) of the isolates from the south. However, in contrast to that of 1993, *V. cholerae* O1 was found to have re-emerged and was co-existing with O139.

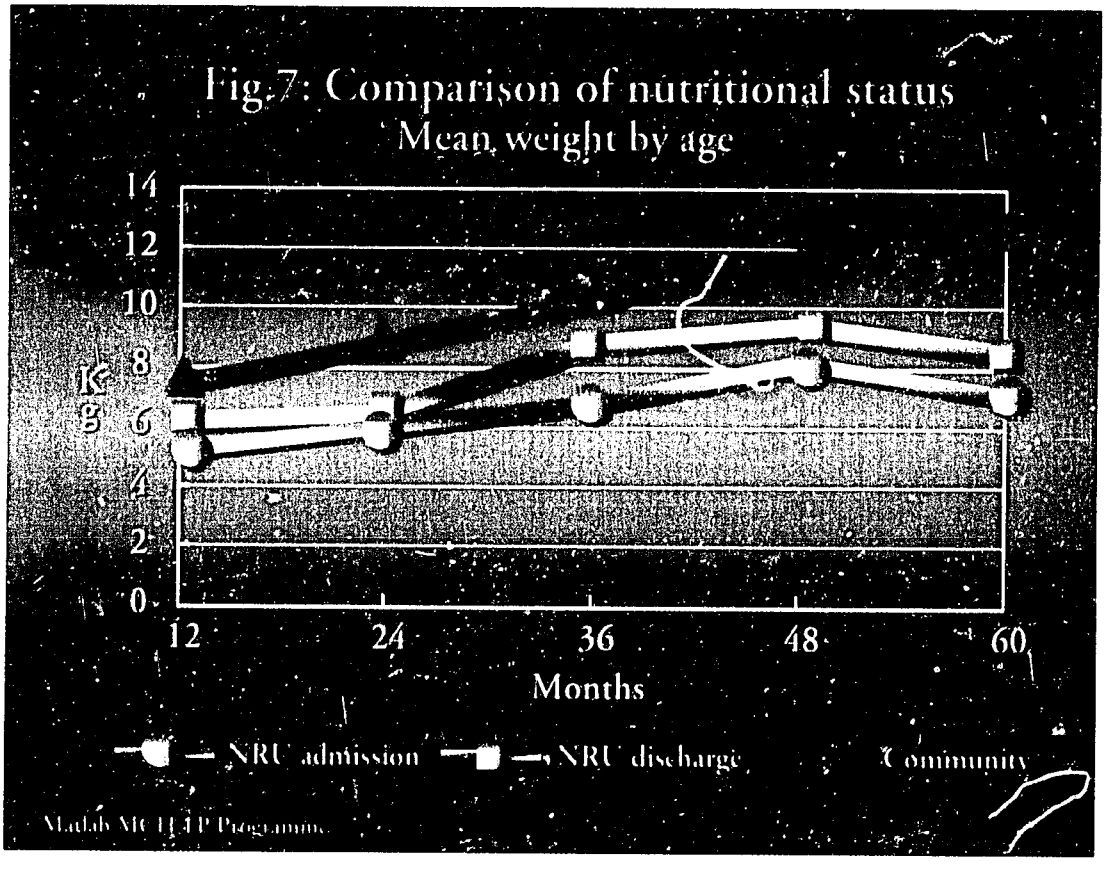
Epidemiology of diarrhoea and ARI in a cohort of newborns in rural Bangladesh

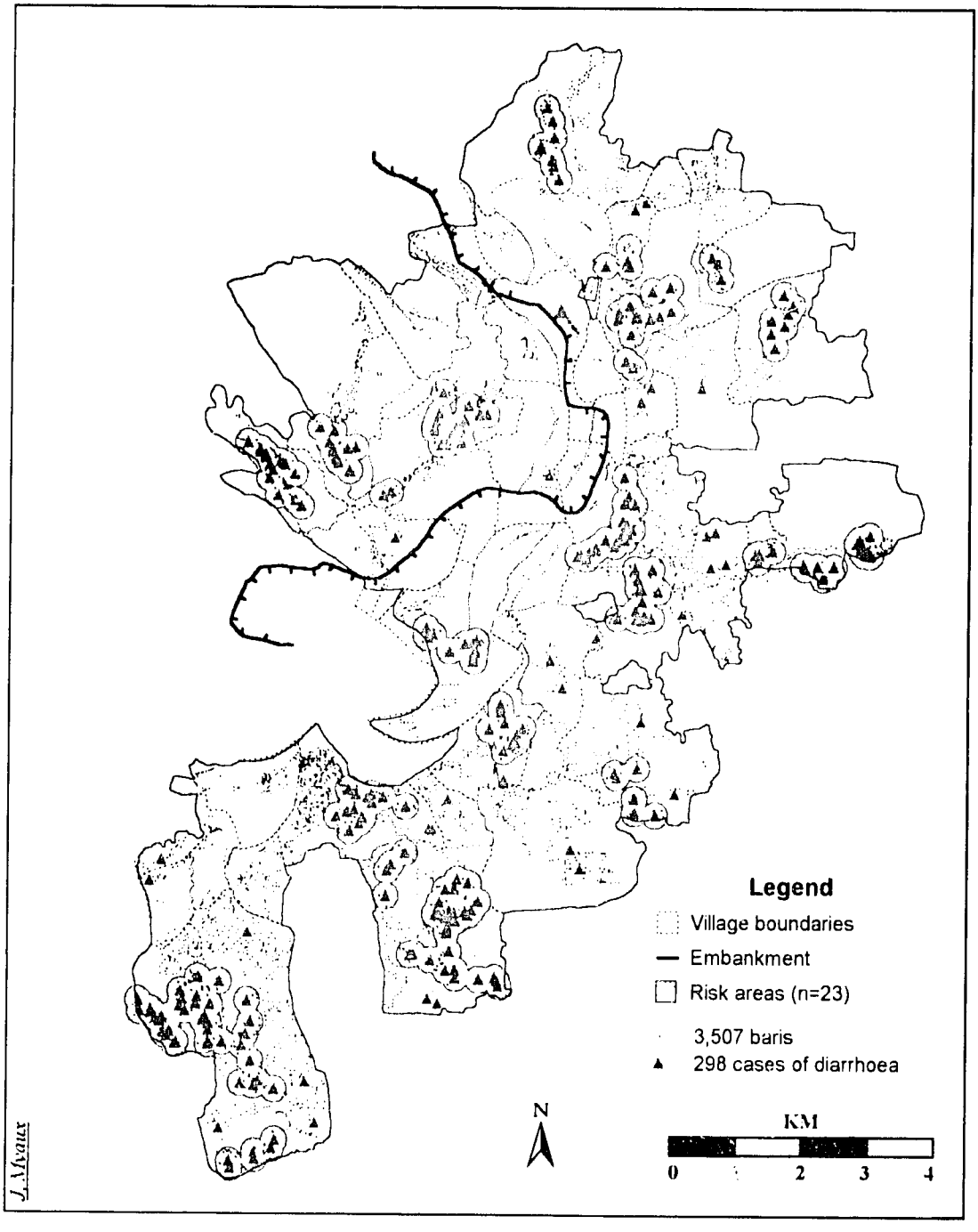
PIs: Kh. Z. Hasan, R.B. Sack, A.K. Siddique, K.M.A. Aziz, J. Albert, L. Unicomb, R. Huq and B.P. Pati

Funded by: USAID

Acute diarrhoeal and respiratory infections continue to be major problems to children of the developing world. Over 25 enteric pathogens are known to cause diarrhoeal diseases, but approximately 25% to 30% of the episodes do not yield a known aetiologic agent.

This is an ongoing study at Mirzapur with support services from a 500-bed general hospital (Kumudini Hospital) located close to the study villages. The enrollment of a cohort of 250 newborn children was required to be followed longitudinally for a period of 24 months from birth to determine: (a) all known and newly-recognized aetiologic agents of diarrhoeal diseases, and (b) the incidence and causes of acute lower




Legend
Village boundaries
Embankment
Risk areas (n=23)
3,507 baris
298 cases of diarrhoea
N
KM
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J. Myaux

respiratory tract infection (ALRI), particularly pneumonia.

The study has a field office and a laboratory at Mirzapur. The Laboratory Sciences Division of ICDDR,B, as a collaborative division of the study, provides support in the areas of microbiology, virology, and parasitology. Over a period of one year, 288 newborns were registered from the ten selected study villages. Every newborn baby was given a unique identification number. All pneumonia and persistent diarrhoea patients are hospitalized for detailed investigation and for proper management. Fresh stool microscopy is done at the Mirzapur laboratory, but samples for all microbiology and virology tests are sent to Dhaka daily.

SAFE Project: a collaboration with CARE-Bangladesh

SAFE Pilot Project

PIs: O.M. Bateman, S. Zeitlyn, S.L. Laston, S. Brahman (CARE) and R.A. Jahan (CARE)
Funded by: CARE

The Sanitation and Family Education Pilot Project (SAFE) is a technical assistance activity for which the CHD provides expertise in epidemiology, anthropology, and hygiene behaviour change. The project, implemented by CARE-Bangladesh, was developed in 1992 to build on a relief effort in the coastal areas of the Chittagong district following the devastating 1991 cyclone in the area. Whereas the relief effort focused on water and sanitation hardware (tube-wells and latrines), the project now focuses on hygiene behaviour change. The objectives of the SAFE project are, therefore, to develop effective, replicable hygiene education strategies to promote behaviour change, to develop and assess different models for hygiene education outreach, and to design and implement a behaviour-based monitoring and improvement system for a hygiene education programme.

A key to the development of hygiene behaviour change activities in SAFE is the collection of information in small qualitative and quantitative research activities, rather than depending on general, stock messages. Based on this information, hygiene behaviour change interventions are formulated that build on current behaviours, that are appropriate to the context, and address a small number of "key" behaviours most strongly associated with diarrhoea transmission.

During 1993, a baseline survey of 720 households was performed; a number of qualitative studies undertaken; intervention messages and delivery methodologies developed; and the intervention was implemented beginning August 1993. The behaviour-based monitoring system was developed and implemented. Final surveys were done in May 1994, and a number of qualitative data collection activities were done from May through August 1994. Three final reports are being prepared: a report on the final surveys, a final report on the qualitative studies, and a report on the monitoring and improvement system. These reports will be published by CARE in early 1995. Results from the final quantitative surveys showed dramatic improvements in all areas of intervention, for all targeted behaviours, and by all measures -- knowledge, reported behaviour, demonstrated practices, and observations. Diarrhoea prevalence was reduced by two-thirds in SAFE intervention areas compared to nearby control areas. Reports from the final qualitative data collection activities showed that the use of multiple channels to disseminate messages in communities, including child-to-child and school programmes, was an effective approach to hygiene behaviour change. This activity provides an example of how efforts to improve the health of community members may be strengthened through collaboration.

Maternal immunization with pneumococcal polysaccharide vaccines

PIs: N. Shahid, F. Qadri, S.S. Hoque, R.B. Sack, T.A. Chowdhury, S. Khatun, R. Ara and K. Begum
Funded by: NIH, USA

The objectives of this study were to determine the antibody response of pregnant women to *Streptococcal pneumoniae* (Spn) or *Neisseria meningitides* (Nm) polysaccharide vaccines, and to determine the levels and proportions of each antibody isotope and IgG sub-type which are

transferred to the newborn via the placenta. It is being undertaken in collaboration with M. Steinhoff of the Johns Hopkins University, USA, G. Siber of Harvard Medical School, USA, and three national institutions: Institute of Post Graduate Medicine and Research, Dhaka Medical College Hospital, and Holy Family Hospital.

Seventy healthy, pregnant women were randomly given either the licensed 23 valent polysaccharide Spn or the Nm vaccine at about 32 weeks gestation. All mothers had serum collected at vaccination, one month after vaccination, and at delivery. Cord blood was collected at delivery, and at 1, 3, and 5 months of age. Nasopharyngeal cultures for Spn were obtained from infants every fortnight until the child was 5 months of age. Colostrum was collected within 48 hours of birth, and breast milk samples at 1, 3 and 5 months.

No notable adverse local or systemic effects were noted after vaccination. Serotype-specific antibodies were estimated by ELISA against serotype 6B and 19F, the two serotypes that have been shown to be the least and the most immunogenic.

Results indicate that high levels of passively acquired specific serum IgG antibody may protect the infant from infant disease until 22 weeks of age. These findings have policy implications for preventive strategies for the ARI programme.

Serotyping of S. *pneumoniae* strains
PIs: N.S. Shahid, S.S. Hoque, M.J. Albert, M. Steinhoff and R.B. Sack
Funded by: USAID and BADC

Pneumococcal diseases are among the most common severe bacterial diseases of infants and children in this region. It is estimated that 20% to 40% of the 4 million infant and child deaths attributable to pneumonia are due to *S. pneumoniae*. The death rate is the highest in the post-neonatal period. There is considerable variation in the serotype distribution between geographic regions. As antibiotic resistance to *S. pneumoniae* is increasing, and since safe *S. pneumoniae* vaccines are being made available, it is important to know the current circulating serotypes in the community. Since the immunity to pneumococcal disease is serotype-specific, the composition of the new conjugate vaccine for *S. pneumoniae* should match the distribution of pathogenic serotypes where they are to be used.

The aims of the study, also done in collaboration with Johns Hopkins University, are to identify the current serotype patterns of pneumococcal strains in the Bangladeshi population and to correlate the clinical features of patients with the isolated serotypes of pneumococci.

Impact of rotavirus infection at birth on subsequent infections
PIs: N.S. Shahid, J. Albert, N.N. Banu, S.M. Faruque and L. Unicomb
Funded by: SDC

The objective of this study, undertaken in collaboration with Dhaka Shishu Hospital, and Holy Family Hospital, is to determine whether exposure immediately after birth with rotavirus (RV) strains influences the outcome of a subsequent infection with community strains. Studies conducted elsewhere have shown that infection of neonates with unique "nursery" strains confer protection against severe diarrhoea upon subsequent infections.

Neonates were enrolled from the two hospitals and followed up daily for the first 7 days and then weekly to 24 months of life, with stool samples collected at each visit and each diarrhoeal episode. Antigen detection for RV was performed daily. Each diarrhoeal stool was matched with a non-diarrhoeal control stool and subjected to analysis for RV, parasites, diarrhoeagenic *Escherichia coli*, vibrios, *Campylobactor*, and shigellae. Colostrum and monthly breast milk samples were collected for estimation of serotype-specific RV antibodies.

Satellite diarrhoea treatment centres (SDTC)
PI: M.H. Munshi
Funded by: Core funds

In an attempt to ease the burden of patients on the Dhaka Hospital, ICDDR,B established a satellite diarrhoea treatment centre in collaboration with the Gonoshasthya Kendra (GK), and Dhaka City Corporation (DCC). Before the formal

opening, an intensive week-long training was organized in ICDDR,B on the management of diarrhoeal diseases, with emphasis on ORT. During January-August 1994, two thousand seven hundred and nine patients were treated at the Islambagh SDTC. On average, 3% of the patients had severe dehydration, and 4% had some dehydration; and the rest had mild diarrhoea.

As a result of various problems -- few NGOs with curative health programmes; expected clinical staff not provided; lack of a mechanism by Government for delivery of clinical supplies -- the second SDTC at Jurain has not been opened and the first SDTC in Islambagh was closed on 15 August 1994.

Environmental Health Programme

Programme Head: A.H. Bilqis

The core members of the Environmental and Health Sciences Interest Group have been reorganized under the Environmental Health Programme. With added emphasis on the environment, the Programme is a multidisciplinary group involving professionals from the fields of environmental engineering, medicine, social science and laboratory research. The overall objective of the programme is to conduct and support environmental health activities, mainly related to the control of diarrhoea and infectious diseases in rural and urban areas.

Fakrul

Appropriate water use and management: an intervention topic for Environmental Health Programme

Research

The research involved includes basic and action research, proposed by members of the programme as well as that undertaken as technical assistance on request from government or non-governmental agencies. Several non-governmental agencies have been included as partners in the action research. This is encouraged in order to develop local resources and share the workload with local NGOs. It is also likely to contribute toward sustainability of the project activities.

Environment and child survival

PIs: A.H. Bilqis, J. Chakraborty and Md. Yunus
Funded by: IDRC

The objective of the study was to determine the association between existing environmental, behavioural, and sociocultural factors and mortality among children aged 1 to 59 months. A case-control design was adopted to compare 625 fatal cases with the same number of age, sex and area-matched living controls. The study has been completed. The causes of death were grouped under diarrhoeal diseases, ARI, accidental, and others. From the initial analysis, it appeared that the following environmental factors were the more important ones for mortality: drinking water sources, amount of water, condition of latrine, type of water used for washing hands after defaecation, whether the cooking place was open or closed, whether or not there were any windows in the child's bedroom, and the number of children sleeping together. The Maternal and Child Epidemiology Unit, London School of Hygiene & Tropical Medicine is assisting in the analysis of data.

Water sanitation situations in selected slums
PIs: A.H. Bilqis and D. Mahalanabis
Funded by: SDC

Improvement of water and sanitation conditions in slums is a recognized global challenge. The Government of Bangladesh has undertaken specific programmes; situation analysis of these undoubtedly will have implications for planning and implementation of future activities.

Slum programmes in Dhaka were studied in the light of existing water and sanitation provisions and their use, the knowledge related to these services among the slum dwellers, and the perception of the residents regarding water and sanitation. These programmes were at three different levels: one programme completed about 3 years ago (City Polly-about 2,500 people), one programme ongoing for about 5 years (Gonoktuli-about 6,000 people) and another programme (IG-Gate-about 1,000 people) initiated recently. Several non-government organizations are also working in those areas.

The water availability problem was acute in City Polly. Sewage disposal was unacceptable and non-functioning in City Polly and in major areas of Gonoktuli since the systems were no longer connected to the main sewage system. In IG-Gate, people were using twin pit latrines and the conditions were acceptable. On average, about 43 people used each hand pump/tube-well, and about 60 people used each latrine. Children defaecated indiscriminately in all three areas. Although health education was a component in the programme, more than 80% people practised poor hand-washing and lacked environmental health knowledge. The slum-dwellers in general preferred integrated rather than isolated health programmes. Our findings confirm that an integrated approach through community participation has greater potential for sustainability.

Action research and impact studies on community water, sanitation and hygiene education interventions in rural areas (In collaboration with Directorate of Public Health Engineering, DPHE)
Advisors: A.H. Bilqis, A.U. Ahmad (DPHE), K.M.A. Aziz, A.H. Baqui, D. Habte, R.B. Sack and R.E. Black
Funded by: SDC

The objectives of this technical assistance project are: (1) to conduct applied research on Social

Bilqis Amin Hoque

Rural women volunteers maintaining a Tara handpump

Mobilization Programme for Sanitation (SOC-MOB) by the GoB, and (2) to assess the health and behavioural impacts of the project. The experience gained from this project will strengthen GoB's capability and appropriate use of available resources to further improve health through integrated water, sanitation and hygiene education and other primary health care programmes. The SOC-MOB programme strategies are developed on four major premises: increased involvement of the community; strengthening of the programme communication and training; forging of alliances with various partners; and the importance of political and social commitment which can be achieved through advocacy. As a part of preparatory activities, three projects which had more or less followed the SOC-MOB strategies were studied.

Of the three studied projects, one was conducted by GoB (Jhalakathi), one by an apex body of NGOs at Lohagara (NGO Forum for Drinking Water Supply and Sanitation), and one by an NGO at Ramgoti. Although, in the use of safe water and hygiene practices, the people of the three thanas were similar and more or less like other rural areas, the rate of use of sanitary latrines ranged from 27% to 88%. The communities in those areas felt that the SOC-MOB programme was not properly implemented, and that the community was hardly involved.

The Ministry of Local Government, Rural Development, and Cooperatives is extending all cooperation in these activities. The local office of SDC has been directly involved in the planning and implementation of the activities.

Impacts of the water-sanitation programme by GoB (DPHE) and UNICEF in Barisal
Advisors: A.H. Baqui, S.E. Arifeen,
N. Shahid and R.B. Sack
Funded by: UNICEF

This technical assistance project is studying the Water Supply and Sanitation Programme by GoB in Barisal which operated from July 1990 through December 1991. In February 1992, about 73% of the families used sanitary latrines. This programme strongly promoted construction of different options of home-made latrines for the

A rural family awaits the Community Health Worker

people who could not afford to construct ring-slab latrines. The Programme's accomplishments are: achievement of the highest sanitation coverage in the country; testing/promoting different options of sanitary latrines; and extensive involvement of specific local groups, especially schools in the sanitation programme.

Considering these facts, UNICEF (Dhaka) requested technical assistance to study the impacts and sustainability issues of the project. The overall objectives of the technical assistance will be to evaluate the water supply and sanitation and health impacts of the integrated water-sanitation programme by DPHE-UNICEF. Data are being collected on sanitation-related specified behaviours/practices, water quality knowledge, prevalence of skin diseases and diarrhoeal episodes among 2,700 children under 5 years of age over a period of 1 year. These children will be selected from families who will be defined as having poor, medium and good sanitation practices.

Graham Wright

Water quality and health inside the Meghna-Dhonagoda Irrigation Project embankment
Advisors: A.H. Bilqis, A.H. Baqui and R.B. Sack
Funded by: Asian Development Bank

The Meghna-Dhonagoda Irrigation Project (MDIP) is a medium-scale flood control, drainage and irrigation project which is situated in Matlab. The project has an area of 17,584 hectare, and forms an island surrounded by the Meghna river on the north and west, and by the Dhonagoda river on the east and south. The objectives of the project were to increase agricultural production, create employment opportunities, and improve living conditions in the area.

Following the completion of the MDIP, adverse social and environmental impacts were publicized. In response to those accusations, several investigatory attempts were undertaken by the concerned authorities, and monitoring of water quality and health was identified as an area for further investigation.

The Asian Development Bank requested ICDDR,B to provide technical assistance to review specified health and water quality data related to MDIP. The data collection/monitoring is being conducted in selected areas between October 1994 and September 1995.

Home-management and ingestion of unsafe water
Advisors: A.H. Bilqis, D. Mahalanabis and K.M.A Aziz
Funded by: UNICEF

Effective use of tube-wells and tap water is an important concern which relates to the real success of water and sanitation programmes. One of the ways for improving effectiveness of any drinking water project is to reduce ingestion of contaminated water.

Forty-five rural women from Matlab and 45 from urban Dhaka slum are being observed between 6 a.m. and 6 p.m. by trained local project workers (females). Water samples are being collected from fifty percent of the households and tested for faecal coliform content. Samples are also being collected of water ingested by those women and their children.

Preliminary bacteriological tests revealed that in samples collected from used tube-wells or taps, faecal coliform count was within acceptable range (geometric mean of counts was less than 10 units/100 ml of water), but in stored water samples, the counts were over several thousand units/100 ml of water.

Action research and impact studies on community water, sanitation and hygiene education interventions in urban poor communities
Advisors: A.H. Bilqis, Q. Mahmood (DCC), M. Ashrafuddin (DCC), A.H. Baqui, D. Habte, P. Winch and R.E. Black
Funded by: USAID

Despite the urban bias in sector investment, effective water supply and sanitation (WSS) coverage in the urban areas is lower than in rural areas. The service has been inequitable with disadvantaged social groups being less served.

However, there have been limited attempts by the GoB and NGOs to improve WSS condition in selected slums. The experiences have been mostly disappointing, and it was found that there were lack of: knowledge related to health benefits and appropriate use of the WSS provisions; community participation; appropriate technology that can work throughout the year; and monitoring and evaluation and appropriate institutional management. The Environmental Engineering and Health sections of Dhaka City Corporation (DCC), the major service provider for primary health care to the poor population in urban Dhaka, have requested the Centre to provide technical assistance for their water and sanitation activities. A study has been undertaken to: develop and test a replicable WSS educational package; strengthen DCC's management capacity in the implementation of a sustainable WSS programme; and develop community participation to improve the service delivery system.

The Programme is being conducted in two phases. Phase I will include a pilot intervention in Ward 48 of Zone 3 and a needs assessment for environmental sanitation and water supply in Zone 3. Phase II will be an intervention in Zone 3 and Zone 7 based on findings of Phase I. The proposed activities will be implemented by the DCC and other concerned agencies working in those areas. ICDDR,B will coordinate, monitor, evaluate, train, disseminate, report and provide other technical assistance.

Laboratories

Two Environmental Health Programme Laboratories are run to conduct tests on environmental samples from projects and external agencies. Of the 2,090 water samples, 100% have been tested for faecal coliform count, 40% for BOD, 40% for COD, 19% for iron, 40% for nitrate, 1% for residual chlorine and 40% for physical tests. Tests were also performed on the quality of water-purifying tablets stored by NGOs and the GoB. Microbiological contamination of 1,136 hands was also studied.

Other Services

Global Applied Research Network (GARNET): The programme coordinates a local networking forum, which was formed in 1991 following the guidelines of GARNET. Representatives from about 110 NGOs, donor, UN and GoB agencies having activities in the field of environment, attend the networking meeting quarterly. In these local meetings selected case studies are presented, and experiences and needs of the members discussed. Seven NGOs have worked in partnership with the programme. This collaborative activity contributes to local institutional and skill development as well as partnership in the sector. The workshop on "Involvement of NGOs in Water Supply and Sanitation Programme of the Government of Bangladesh from 1996-2000: Five-year Plan" was an activity of this group.

Health Systems Research Interest Group
Coordinator: M. Desmet

This Interest Group was established during the retreat of the Community Health Division in November 1993. Its general objectives are: to provide a forum for exchange of ideas and discussion of studies related to the field of health systems research (HSR); to facilitate and stimulate the formulation and preparation of protocols; to advocate HSR-related topics when the need is felt; and to provide support for junior researchers.

The Group was conceived as an academic, not an administrative, forum. The activities comprise regular group meetings, seminar presentations by external speakers, and special arrangements for supporting junior researchers such as discussions on case studies. Membership is open to Community Health Division (CHD) and non-CHD members from the projects dealing with aspects of HSR. The activities of the Group are managed by a coordinating team, headed by an appointed leader.

In 1994, the HSR Interest Group organized past and current HSR activities of the MCH-FP Programme in Matlab; discussed future possible

involvement in HSR in Matlab; and determined the dimensions and definitions of HSR.

Health care use patterns of slum residents in Dhaka city
PIs: M. Desmet, S. Zeitlyn and J. Myaux
Funded by: IDRC and BADC

This study, which started in 1993, has as its overall aim a comprehensive analysis of the health care-seeking behaviour of the slum population. The specific objectives are: (a) to identify components of health care decision-making, i.e. types and reasons for use and non-use of health care options which slum people perceive as being available to them, and (b) to investigate the variables that contribute to health care choice-making, considering the characteristics of the ill subjects and the households to which they belong, and the health care resources that they have used.

The study consisted of three consecutive data collection phases: key informant interviews with slum residents and practitioners working in the slums on the components of health care decision-making; a 6-month longitudinal survey in 1,050 households; collecting data on new illness episodes through fortnightly visits, followed by a series of case studies on specific health care-seeking behaviour or illness experiences.

Social Science Interest Group
Coordinator: K.M.A. Aziz

The Social Science Interest Group is involved primarily with social and behavioural issues that are important to the implementation of public health interventions. Behaviour is influenced by culture and geography, and this must be considered when change is necessary for the sake of the community's health. In its periodic meetings, efforts are made to bridge the gap between social and biomedical sciences with the participation of scientists in both these broad areas and all of the divisions.

Implementation of nutrition education strategy for promotion of beta-carotene rich foods as a source of vitamin A in children
PI: K.M.A. Aziz
Funded by: SDC

The objective of the protocol is to implement the nutrition education strategy that was developed in the first phase of this investigation, which will lead to improved preparation and increased consumption of beta-carotene rich vegetables and fruits by young children and mothers. Two sets of villages were selected in Matlab: one as intervention area and another as control area.

Fakrul

Mothers who accompany their sick children in the hospital receive practical training on dietary sources of vitamin A

One hundred and sixty households, each with a mother and an index child aged 6 to 59 months, have been identified from each of the study and control areas. The criteria of selection of households were: the mothers should be illiterate: the household members should not possess working watches and/or working radios; a household should not have cultivable land exceeding 50 decimals; and a kitchen garden space should not exceed more than half of the dwelling space. The baseline and follow-up surveys are: six-monthly KAP and in-depth interviews; quarterly participant observation; and bi-monthly 24-hour dietary recall. Bi-monthly education on cooking procedures and dietary intake is being given to the mothers of index children in the study area only. Moreover, clinical examination of eyes and anthropometric measurement of index children in both the study and control areas were done at baseline and are to be repeated quarterly. Blood samples from a randomly selected sub-sample of children were taken at baseline and will be repeated after 12 months for determination of vitamin A levels. Food samples were obtained at the baseline and will also be collected during the three major seasons of the year.

Women and health: exploring the socio-cultural barriers and determinants of women's health status in rural Bangladesh
PIs: S.L. Laston and K.M.A. Aziz
Funded by: IDRC

The aim of this study is to understand the socio-cultural determinants of women and children's health status in the comparison area of Matlab through use of qualitative and quantitative methods to identify barriers and potential agents of change in health care-seeking behaviour. Special attention will be given to pregnant women, traditional birth attendants, school teachers, traditional and biomedical practitioners, and mothers and their children.

The initial stage of this ongoing study involved participant observation by anthropologists to develop rapport with community members in two study villages (inside and outside the embankment) in the comparison area. Activities during the subsequent period included key informant interviews with women, village leaders, school teachers (Government and BRAC), children, traditional and biomedical practitioners (including pharmacists), and traditional birth attendants. Currently, information is being collected from 100 pregnant women, their husbands, and their birth attendants to describe health problems, health care-seeking behaviour, and reasons for not seeking health care during illnesses experienced during the antenatal and postnatal period.

Social and Behavioural Sciences Programme

Head: J.L. Ross

Background

There is increased recognition among health practitioners in general, and among the Centre's management and scientists, of the need to understand the social, economic, and cultural factors that influence improvements in health-related behaviours and status. It is now acknowledged that efficacious biomedical services require a thorough understanding of the cultural context of behaviour, particularly as it relates to illness. Living conditions, including household composition, attitudes toward people of different ages, marital status, and gender, may influence health and disease and the ability of individuals to prevent and/or obtain treatment for various conditions. Such a holistic perspective necessitates a multidisciplinary approach; insights from the social and behavioural sciences must be integrated with those gained from biomedical and demographic research.

As the Centre continues to broaden its scope of work, it is no longer sufficient to merely describe differentials in fertility and mortality. There is, for example, a need to explain why such individual, household and community-level differentials exist. Several major initiatives recently begun or planned by the Centre illustrate the need for a greater social science presence. These include: the Urban Health Extension Project, where a comparative perspective on the reproductive health of women

requires significant social science input; a new initiative related to RTIs/STDs/HIV/AIDS where research on human sexuality and behaviour will be essential; and the BRAC-Matlab joint project examining a number of dimensions of the interrelationship between health and development, including the empowerment of women.

The Centre is uniquely positioned both to integrate the social and behavioural sciences with biomedicine, and to advance a social science agenda. Until recently, the Centre has relied upon interim measures to represent the social and behavioural sciences, i.e. the creation of a Social Science Advisory Committee to the PFPD, and an Expert Group to advise on the BRAC-Matlab joint venture. Their contribution has been invaluable, but such measures simply cannot meet the needs of the Centre nor institutionalize the social and behavioural sciences--now of first priority in terms of strategic objectives.

Action

In June 1993, the Board of Trustees gave its unanimous support to the Strategic Plan of the Centre by approving a position for a Senior Scientist in the Social and Behavioural Sciences Programme. The objective of this initiative is to place the social and behavioural sciences in a position of prominence within the Centre, on a footing equal to that of the biomedical and population sciences. The Senior Scientist will be an institutional resource person, providing expertise throughout the Centre and across divisions.

A major responsibility of the Senior Scientist and SBS colleagues will be to define that potential, to set priorities, and to develop the institutional response to the challenge that lies before us. It is expected that the SBS will play a critical role in defining and articulating the role of the social sciences at the Centre, and in implementing the Centre's Strategic Plan for the years 1995-2000.

Donor Support

The identification and articulation of this strategic objective was generally welcomed in both scientific and donor communities. The Ford Foundation immediately came forward with three-quarters of a million dollars in support of this initiative over a three-year period. This early commitment by the Foundation was essential to implementing the Centre's plan of action in a timely fashion. The Foundation's support allowed for the recruitment of a Senior Scientist covered the initial costs of establishing a Social and Behavioural Sciences Programme, and permitted the recruitment of Bangladeshi staff.

Research

A principal training strategy is learning-by-doing. For example, research staff will undertake a number of discrete exercises, such as conducting in-depth interviews with key informants, conducting focus group or participatory exercises, and undertaking free-list and pile-sort exercises. These exercises will be integral to existing protocols, e.g. BRAC-Matlab, MCH-FP, and will relate to research priorities identified with those initiatives, e.g. women's empowerment. In addition to this initial research-cum-training strategy, senior staff will begin the process of developing scientific protocols for competitive funding. The areas of interest have been articulated in the Centre's Strategic Plan and include abortion, RTIs/STDs, and violence. In the interim, it is expected that junior staff will rapidly acquire the range of skills in both qualitative and quantitative methodologies which will be required to initiate this expanded scope of work.

Collaboration: Mention has already been made of the contribution of both Social Science Advisory Committee and the Experts Group to the BRAC-Matlab Research Programme. The Centre hopes to improve upon this model by encouraging even greater collaboration with other individuals and institutions in the scientific community. Specific programming is planned with the London School of Hygiene & Tropical Medicine, the University of Connecticut (USA), the University of South Carolina (USA), and the University of Pennsylvania (USA). The possibilities of in-country collaboration would be with the Ford Foundation, Jahangirnagar University, and the Bangladesh Women's Health Coalition.

The impact of social and economic development programmes on human health and well-being: a BRAC-ICDDR,B collaborative project in Matlab

PIs: A. Bhuiya and M. Chowdhury
Funded by: Ford Foundation and USAID

This is an ongoing project jointly undertaken by BRAC and ICDDR,B in Matlab since 1992. The main objective is to assess the impact of the BRAC's integrated rural development programme on health and other aspects of human well-being, and understanding the pathways of influence in such areas. The development intervention included education, skill development, social awareness, and collateral free loans to very poor households, and their women members in particular. The study design allows one to investigate the joint and independent impact of the development and MCH-FP Programme interventions both cross-sectionally and longitudinally.

The baseline survey revealed that nearly 50% of the Matlab households are eligible to be the BRAC's target group for they possess less than 50 decimals of land and at least one member of the household sells more than 100 days of manual labour. More than 85% of the households use tube-well water for drinking and around 95% use surface water for cooking and other washing purposes. Only 8% of the households have safe toilet facilities, where the excreta are not drained to surface. 26% of the female respondents reported washing their hands with soap after defaecation. 30% of the adult male respondents reported being ill during the 15 days preceding the survey; half of them lost more than seven days of normal work due to illness. This survey, which was independent of ICDDR,B's service statistics, revealed a contraceptive prevalence rate of 63% in the MCH-FP area and 32% in the comparison area: acceptance was higher among the BRAC target group than the non-target. In their attempt to develop a research agenda to understand the mechanism of impact, the project researchers identified seven dimensions of human well-being. They included increased income, improved nutritional status, improved women's lives, control over fertility, decreased morbidity, decreased mortality and healthy/sustainable environment. Seven teams were formed to generate hypotheses centering around each of the dimensions. The Principal Investigators shared the research plan with colleagues at Harvard University, Cornell University, and London School of Hygiene & Tropical Medicine during the second half of 1994.

Improvement of health through a community development-oriented programme in rural Bangladesh

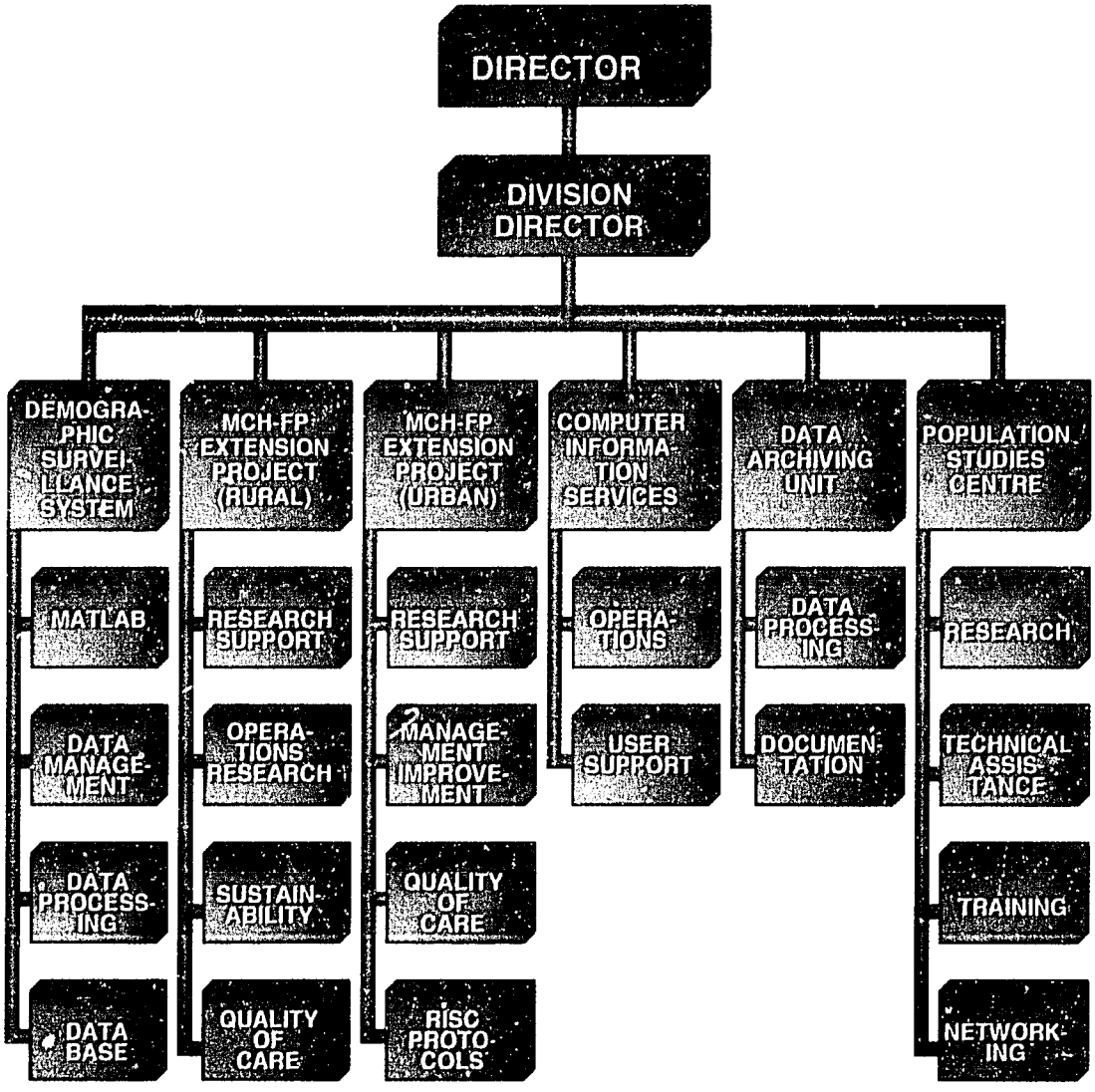
Project Director: A. Bhuiya
Funded by: Swiss Red Cross, representing a consortium of the German, Dutch, and Swiss Red Cross Societies

This new initiative began in 1994 in Chakaria thana under Cox's Bazar district. The main objectives of the project are to: (a) build awareness among community members about health, prevention and management of diseases, environment, fertility control, and antenatal and postnatal care; (b) develop a strategy to ensure community participation in health-related activities through identification and/or formation of self-help organizations, and (c) find appropriate ways to assist the self-help organizations to be self-reliant to reduce their vulnerability to health crises.

Much of the time this year has been spent in orienting the project staff toward project philosophy and providing them with appropriate training, especially in participatory methodologies. To start with, the project decided to work with the existing indigenous village organizations/initiatives. Forty-five organizations/initiatives have been identified in one union, almost all of which were formed through initiatives of the villagers, and have been in existence for the last 5 to 40 years. The organizations have been engaged in various social welfare activities, including education (secular and religious), economic upliftment, social and cultural activities. Some are focused only on specific professions, such as betel leaf growers and rickshaw pullers. Health issues are not on their agenda. The project staff have been successful in establishing a confident relationship with the villagers and bringing health onto their agenda.

Photo: Asem Ansari

POPULATION AND FAMILY PLANNING DIVISION



POPULATION AND FAMILY PLANNING DIVISION

Division Director: Michael A. Strong

Divisional Highlights

- The rural MCH-FP Extension Project started activities in Chittagong, the low performing family planning area of the country.
- The urban MCH-FP Extension Project began its collaborative work with Concerned Women for Family Planning in urban Dhaka.
- A study to validate the rational Demographic and Health Survey began using the DHS survey in Matlab and DSS data.
- Scientists contributed to the International Conference on Population and Development, Population Association of America and Seoul Conference on issues related to preference for male children.

Although the name of the Centre is International Centre for Diarrhoeal Disease Research, Bangladesh, it is also considered a Centre of Excellence for population studies. There is no other institution in the developing world which has made as many contributions to population science as the Centre. The starting point for population studies came with the establishment of a rural Demographic Surveillance System (DSS) in Matlab in 1966. Currently, about 200,000 people live in the area covered by the DSS. Fortnightly interviews with each household in the area ensure that every demographic event is accurately recorded.

Pioneering studies, such as on the relationship between breast-feeding and fertility or the effects of son preference on fertility and mortality, were produced from the DSS data. In 1975, the Centre began an initiative to use Matlab to test an improved family planning programme, and in 1977 the Centre initiated an integrated MCH-FP project in half of the area covered by the DSS. This project demonstrated that a high contraceptive prevalence rate (CPR) and reduction in fertility are possible in a poor socioeconomic setting. The rural MCH-FP Extension Project, begun in 1982, was undertaken to discover how elements of the Matlab programme could be transferred to the national family planning programme. The Bangladesh national family planning programme is now considered one of the most successful in the world. The ICDDR,B's contribution to that success is remarkable. Originally, the ICDDR,B's contributions were confined mostly to the technical and biological aspects of population science. It expanded its mandate to social science research in population, anticipating the essence of the 1994 International Conference on Population and Development in Cairo.

Demographic Surveillance System

Project Director: Michael A. Strong
Funded by: UNFPA, ODA, and Core funds

The DSS is a classic demographic surveillance system. Since 1966 it has collected data on vital events from a population that initially comprised some 140,000 people and has grown (despite contraction in geographical coverage) to about 200,000 individuals. In size and historical depth it is unique, and has been described with every justification as the jewel in the ICDDR,B's crown.

Initial data collection is performed by female community health workers (CHWs) who visit each household every fortnight. In the "treatment area" of Matlab thana, CHWs are also responsible for family planning and health services. In the comparison area, CHWs do not provide services, and the ratio of workers to population is correspondingly higher: 1 to 3,500 compared to 1 to 1,200. The data collection activities of CHWs are verified by male workers called Health

Assistants (HAs). These HAs accompany CHWs on a monthly canvas of all households.

The DSS records six types of vital events: pregnancy outcomes, deaths, in-migration, out-migration, internal movement, and changes in marital status. For each event a one-page form is completed by an HA. Until 1988 these forms were sent to Dhaka for entry and editing. Since then entry and initial edit have been done in Matlab and, as a consequence, there have been great gains in the speed and efficiency with which simple errors can be detected and corrected. Vital event data are transferred to ICDDR,B's headquarters and are further checked before entry into the database. At this stage they are used to give the key vital rates published in the Early Indicator series and the ICDDR,B's Annual Report. During entry into the data base further consistency checks are carried out, and more serious errors are referred back to Matlab for reconciliation. Once the data are clean, detailed tables can be produced, forming the basis of the DSS Annual Report. Additional data collection by the DSS includes the censuses conducted in 1974, 1982, and 1993.

DSS Reports

Since 1966 the DSS has produced an Annual Report detailing the demographic situation in Matlab. The Annual Reports for 1990 and 1991 were published during 1994.

Early Indicator series

Since DSS Annual Reports are large and complex and thus somewhat difficult to produce and understand, a brief report presenting key demographic indicators is now produced as well. Issues in this Early Indicator series will appear shortly after the end of each year. The first report, "Demographic Surveillance System: Early Indicators: Matlab-1993" was distributed in July 1994. This report was widely circulated to policy-makers, organizations, and scientists in Bangladesh and abroad. Important findings in 1994 included the continued decline in fertility in both areas (total fertility rates declined to 2.9 in the MCH-FP area and 3.9 in the comparison area). The infant mortality rate declined to 62 in the MCH-FP area but remains near the 100 level in the "comparison area."

Rural MCH-FP Extension Project

Project Director: Barkat-e-Khuda
Funded by: USAID, Dhaka, and BADC

The MCH-FP Extension Project (Rural) is a collaborative effort of the Ministry of Health and Family Welfare (MOHFW) and the ICDDR,B, supported by The Population Council. Its purpose is to improve the effectiveness and efficiency of the national family planning (FP) and maternal and child health (MCH) programme through applied research, dissemination, and technical assistance. Applied research is carried out in three government field sites, Abhoynagar thana in Jessore district, Sirajganj Sadar thana in Sirajganj district, and Mirsarai thana in Chittagong district. In addition to USAID funds, the Project received funding from the Belgian Government (BADC) for the costs of selected maternal health interventions.

The year started with a number of changes in the project management. Dr. John Haaga left at the end of 1993, and Professor Barkat-e-Khuda joined as the new Project Director, effective May 1, 1994 on secondment from The Population Council. Until then Associate Project Director, Dr. Rushikesh Maru, acted as the Project Director

The Project undertook a number of important activities: conducting a needs assessment; a launching ceremony in the new project site at Mirsarai thana; a comprehensive review and modification of the work plan for the period 1994-1997; and increased collaboration with the GoB officials at various levels.

At the initiative of the MOHFW, the Project opened a new field site in the lowest performing division Chittagong, and selected Mirsarai thana as the intervention area. At Mirsarai, the Project began field-testing various interventions to improve coverage, quality of care, and sustainability of the MCH-FP service delivery programme. The Project undertook a thorough review of the Work Plan (1994-1997) to make it more need-based and focused, and to meet the short- and long-term priorities of the national MCH-FP programme.

The Project increased its collaboration with the Government through regular meetings with the concerned authorities, including the Health Minister, Health Secretary, Directors General of Health and Family Planning, as well as joint field visits with the concerned GoB officials. The purpose of this collaboration is to ensure a greater sense of participation and ownership of the GoB officials in the Project activities.

In support of various Project activities, the GoB has made special financial allocations to facilitate setting up an Emergency Obstetric Care (EOC) Centre at the Thana Health Complex (THC) at Mirsarai. The Project will provide technical assistance in EOC to promote medically-assisted deliveries, ensure referral of complicated deliveries to higher level, and promote consciousness-raising efforts for the community, hopefully resulting in improved maternal health.

The Project focuses on three areas of applied research in the field of family planning: (1) improvement of management capability of the national programme, (2) quality of care of family planning services, and (3) promoting sustainability of the national family planning programme.

Demographic research largely concentrated in the areas of contraceptive method choice and continuation, proximate determinants of fertility, relationship of the FP programme with maternal and child health, nutrition, and desired fertility.

Improvement in management capability

Three interventions were initiated in 1994. The intervention "performance planning and monitoring at the local level" attempts to enhance the skills of thana managers (TFPOs) and union supervisors, known as Family Planning Inspectors (FPIs), for supportive supervision. A monitoring tool, the FPI Diary, has been developed for improving the performance of FP field workers and improving the quality of data.

The MOHFW found the Family Welfare Assistant (FWA) Register, a Management Information Systems (MIS) tool previously developed by the Project, to be useful in improving field workers' performance. Following a similar strategy, a register has been developed for the Health Assistants (HAs), who provide primary health care services to the community. The HA Register has been field-tested at Abhoynagar, and has been approved by the MOHFW for nationwide implementation. The Project will introduce the HA Register in its sites beginning March 1995.

The interventions being field-tested at Mirsarai, and which are successful, will be scaled-up in other thanas of Chittagong district through "district approach." Family planning and health managers of other thanas are being sensitized, motivated, and updated on various project activities undertaken at Mirsarai and Abhoynagar through quarterly workshops, as well as meetings, training, and study tours. A network of government agencies, NGOs, and private organizations will be developed to increase the accessibility to, and coverage of, services. This will facilitate a relatively rapid scaling-up of successful interventions.

As part of this strategy the Project continues to provide limited technical assistance (TA) to the district and thana managers of Sirajganj, where the Project is in the process of being phased out. TA is being provided to determine the sustainability of some of the interventions previously initiated by the Project and to scale-up key interventions in other thanas of Sirajganj district.

Improvement in the quality of care of family planning services and EOC

Two interventions have been developed -- broadening of method-mix of contraception and EOC at Mirsarai. Following training of field workers and paramedics, doorstep injectable services have been introduced at Mirsarai, with plans for phased expansion to other thanas. Management of reproductive tract infection will begin to eliminate the barrier to the use of intrauterine devices (IUD) in the community.

The intervention on EOC will build a new infrastructure at the Mirsarai Thana Health Complex to develop a model maternity care centre, which will have a well-equipped delivery room, emergency drugs, provision for Caesarian section and blood transfusion. An obstetrician will conduct complicated deliveries, perform Caesarian sections, and train medical officers.

Asem Ansari

Injectable contraceptives are becoming increasingly popular

Lessons learned on the expansion of doorstep injectable contraceptives in eight thanas of the country were reviewed at a workshop. The findings show that the FWAs, after proper training, can safely deliver injectable contraceptives. The first dose was still given by the Family Welfare Visitor (FWV) to ensure proper screening of clients. Contraceptive use increased significantly after introduction of doorstep injectable services. About 50 percent of the injectable users were new acceptors, while the rest switched from other methods.

Experience at Abhoynagar, with a less-intensive community-based distribution (CBD) service delivery system, and Matlab, with a strong CBD programme with frequent routine home visits of field workers of ICDDR,B, were compared to determine the extent of the utilization of EOC. Surprisingly, admission at the THC or maternity centre at the thana-level was similar for both areas (7-9%). In both areas, referral of pregnancies to comprehensive EOC was about 1.5 percent, which was much lower than expected.

A workshop on "Disease patterns, treatment practices and drug requirements in rural MCH-FP government facilities" was held. The major findings were: services provided and disease profiles were different in fixed Family Welfare Centres (FWC) from those in the satellite clinics (SC); paramedics did not use an approach based on specific signs and symptoms to establish diagnoses; they did not know many of the recommended treatments; and the drugs included in the present kits did not match the needs. It was recommended that separate kits be provided for FWCs and SCs; and that the contents of the kits and the distribution patterns be revised.

A study was conducted on an IUD sterilizer used in SCs. Results showed that the sterilizer was easy and convenient to use, and sterility of the equipment was maintained. The use of an IUD sterilizer will assist in improving the quality of services. However, its use also depends on the availability of transport and money for kerosene, as well as some modifications of instruments and compartments.

Promoting sustainability of the national family planning programme

Two interventions have been initiated in an effort to determine the extent to which the CBD system can be modified to reduce dependence on field workers. An intervention, known as cluster visitation, is being field-tested, under which FWAs counsel and distribute contraceptive methods from

a "cluster household" among the women of surrounding households. This approach will serve two purposes. First, it will result in the reduction of travel time of workers, and thereby increase coverage of clients for counselling on methods and side-effects. Second, village women will develop a norm of going out of their homes for MCH-FP services.

The second sustainability intervention involves provision of a range of MCH-FP services. These include antenatal care, postnatal care, injectable contraceptives, IUDs, side-effect management of contraception, and health education by female paramedics known as Family Welfare Visitors (FWV). These are provided through an increased number of satellite clinics (SC), and held jointly with EPI sessions. 20-24 such sessions are held per month, compared to eight per month nationwide.

Survey and research activities

A sample registration system (SRS) has been set up at Mirsarai thana, and at Satkania thana, a comparison thana of Chittagong district. The SRS covers a population of 34,175 in 5,951 households. A KAP survey among married women of reproductive age in the sample households has been completed. Data collection instruments have been developed, pre-tested, and fielded to measure the impact of the seven interventions mentioned above.

Based on the SRS and other special surveys conducted over the last decade in Abhoynagar and Sirajganj, a number of research projects have been completed. Home visitation of outreach workers not only increases contraceptive adoption and continuation, but also increases the likelihood of women's attendance at the SCs and FWCs. Other correlates of attendance at the SC and FWC are: relatively old age, contraceptive use, maternal education, and proximity to the service centres.

An analysis of contraceptive method-mix showed that there were differences in method use by socioeconomic and demographic characteristics. Husband's approval positively affects wife's contraceptive use, particularly adoption of sterilization. Effect of wife's approval is weaker for sterilization than for other methods. Both wife's and husband's education were positively associated with the use of pills and other less effective methods but negatively associated with the adoption of sterilization and injectables.

Birth spacing through the use of FP can enhance child nutrition. Continued breast-feeding in early childhood increases the quality of nutrition. Another study examined trends in induced abortion and identified associated risk factors at Abhoynagar, Sirajganj, and Matlab. Induced abortion ratio increased over the last decade, while miscarriage and still-birth ratios did not change. Abortion was higher among the educated, and better off women. Abortion was higher among the contraceptive users, particularly condom and pill users, than among non-users, whereas injectable users had abortion ratios similar to those of non-users. The study concluded that there might be unplanned pregnancies due to failure of methods used and inaccessibility to services.

Non-programmatic factors such as gender preference continue to inhibit contraceptive use. Couples with a balanced family (at least a daughter and a son) have highest use, followed by couples having only sons.

An analysis of the utilization of trained traditional birth attendants (TTBA) shows that although TTBAs are less frequently used, they are called upon in cases of difficult births, indicating that they are considered by the community as qualified persons to perform deliveries.

Urban MCH-FP Extension Project

Project Director: N. Paljor (until May)
A.H. Baqui (since June)
Funded by: USAID, Dhaka

Project's Highlights

- Urban MCH-FP Extension Project, the successor of UHEP, in partnership with the Government of Bangladesh and Concerned Women for Family Planning, has begun a new Urban MCH-FP Initiative.

- To provide policy guidance to the urban project and to initiate policy change based on its activities, a National Task Force, headed by the Secretary, Local Government Division, GoB has been formed.

- A Dhaka City Corporation Planning and Coordination Committee has been formed.

- An assessment of programme needs in Zone 3 of Dhaka City has been completed.

The Project has undergone major changes in 1994. The Urban Health Extension Project (UHEP), the predecessor of the Urban MCH-FP Extension Project, was successfully completed in July 1994. USAID, Dhaka began funding a three-year follow-on Urban MCH-FP Extension Project which began on August 1, 1994. In partnership with the Government of Bangladesh and a leading national NGO Concerned Women for Family Planning (CWFP), the Urban MCH-FP Extension Project aims at investigating means of strengthening the provision of cost-effective family planning and MCH services in one area of Dhaka city. In addition, the Project will provide assistance to adapt the innovations in other parts of Dhaka and other urban areas, thereby influencing GoB's urban family planning and health policies and programmes.

Urban Health Extension Project (UHEP)

The objectives of the UHEP were: (a) to develop a sustainable and cost-effective MCH-FP service delivery system for the urban population, with particular attention to the urban poor; and (b) to develop a sustainable urban public health research infrastructure and research capacity within ICDDR,B.

The main activities were: (a) providing services to urban slum populations through the project's volunteer-based service delivery system; (b) conducting operations research to further refine the Urban Volunteer Service Delivery System; (c) determining the health and family planning needs of Dhaka slum populations by maintaining the Urban Surveillance System (USS) and analyzing the USS data; (d) documenting and disseminating the lessons learned from the volunteer system as well as from the USS; and (e) providing technical assistance to other service providers for the adoption of volunteers into their service delivery systems.

Urban volunteer service delivery system
PIs: S. Laston, M. Khatoon, S.A. Jahan, J. Khatun, M. Jahan, M. Islam and N. Paljor
Funded by: USAID, Dhaka

During 1994, the project documented and disseminated the lessons learned from the urban volunteer system. The project also provided technical assistance to a number of Dhaka-based NGOs to integrate the existing UHEP volunteers in their service delivery systems.

The initial objective of the volunteer service delivery system was to test the feasibility and impact of using volunteer women from slum communities as providers of preventive health care and referral information for slum residents. Special attention was paid to the health needs of women, and children under five years of age. The programme's original focus was diarrhoea control through health education and distribution of prepackaged ORS, but over time nutrition, immunization and family planning activities were included.

Volunteers were recruited and trained to educate and motivate mothers to use ORS, immunize their children, improve their own and their children's nutrition, and adopt contraception. The volunteers also distributed ORS. A cadre of paid para-professionals continued to work with the volunteers in providing domiciliary preventive health services.

Evaluation of the volunteer system revealed that: (a) it was feasible to recruit and train largely illiterate and semi-literate slum women as health volunteers; and b) the volunteers effectively improved mothers' knowledge and practices in the project's four intervention areas. These findings led to the conclusion that it might be possible to delegate certain health service delivery responsibilities to community-based volunteers. The evaluation findings showed that the use of volunteers could be one of the components of the overall service delivery system, especially for the

Mohammed Ishaque

The Urban MCH-FP Extension Project participated in the highly successful National MCH Fortnight in Dhaka

slum populations, and they can indeed make a difference in promoting health awareness and linking service providers with needs of the slum populations.

Urban Surveillance System
PIs: A.H. Baqui, K. Jamil, Q. Nahar, S.E. Arifeen, Z. Quayyum, S. Nurani, S. Nasreen, H. Nazrul, R. Islam and N. Begum
Funded by: USAID, Dhaka

Since mid-1990, the UHEP maintained a health and demographic surveillance system, known as USS, in a representative sample of the urban slum population of Dhaka city. The USS was designed to collect reliable information, specifically on the urban poor, for a better understanding of the health and family planning service needs and constraints of the slum population and to evaluate the effectiveness of the urban volunteer service delivery. The USS also provided sampling and infrastructure for other epidemiologic, demographic, social science, and operations research. The estimated total target population of the USS was about 376,000 residing in the slums of five thanas of Dhaka city. Data on demographic events, family planning and health-related behaviours, as well as family planning and health service delivery were collected on a 90-day cycle. Socioeconomic information was collected annually. To ascertain cause of death, verbal autopsies were conducted on all reported deaths. The data collection was supplemented periodically by survey modules exploring topics in depth.

Dissemination: UHEP heid a number of seminars and workshops for planners, service providers, and decision-makers, and published several Working Papers. The project staff also participated in a number of seminars, workshops, and conferences outside ICDDR,B and Bangladesh.

Technical assistance: As UHEP evolved into an operations research initiative, service provision through the project was phased out. The 321 volunteers located in the slums of the five thanas under the Project were believed to be valuable resources, who should be utilized by other

organizations. Twelve NGOs expressed interest in integrating the volunteers into their ongoing activities. The project's Community Health Coordinators then followed up with these NGOs during March and April, 1994, working eventually with eight NGOs (Church of Bangladesh, Shakti Foundation, Bangladesh Women's Health Coalition, Concerned Women for Family Planning, Manobik Shahajjo Shangstha, ActionAid, World Concern, and Community Health Care Project) to develop integration plans from June to August 1994. Ultimately, five NGOs were able to successfully integrate some volunteers into their programmes by October 1994. Of the 321 volunteers, 104 were integrated into the five NGOs. Several NGOs stopped pursuing the process because they did not realize that funds were necessary to sustain a volunteer programme.

Urban MCH-FP Extension Project (Re-organized)

Background Issues

The Urban Health Extension Project's experience has led to the recognition that Bangladesh's urban health and family planning programmes are faced with a number of special constraints. Two critical constraints are:

> The urban population of Bangladesh, and especially Dhaka, is increasing rapidly. According to the 1991 census estimate, about 21% of the country's population is urban. The urban population is growing at a rate of approximately 6% per year. The population of Dhaka is projected to be 10 million in the year 2000. It has been estimated that about a third of Dhaka's population live in the slums and that the health and family planning situation in this population is even worse than in the rural population. The health and family planning needs of urban slum-dwellers are much greater than those of the average Dhaka city dweller, yet they are being served much less effectively by the current system.

> The Government of Bangladesh has a structured and comprehensive health and family planning service delivery system for the rural population, but does not have a comparable infrastructure for the urban population. Non-governmental organizations (NGOs) and the private sector are the primary providers of services for the urban population, even for the urban poor. Private care is available in proportion to clients' ability to pay, but is extremely limited and of questionable quality. The NGO network providing health and family planning services by itself neither has adequate resources to meet all of the needs, nor is adequately coordinated in terms of either geography or type of services.

It is unrealistic to expect either the private or NGO sectors to address these problems adequately. The GoB is also not able to provide basic services, but should at least coordinate and monitor them.

In response to the concern for improving urban health and family planning services, the Urban MCH-FP Extension Project of ICDDR,B, in partnership with the GoB and Concerned Women for Family Planning (CWFP), has begun a new MCH-FP Operations Research Initiative. The purpose of this initiative is to investigate means of providing innovative and cost-effective family planning and MCH services to the urban population.

Project Description

The objectives of this collaborative project are: to develop a coordinated, cost-effective and replicable system of delivering MCH-FP services in one area of Dhaka city, with a special focus on poor and slum populations; to disseminate the project's findings and provide technical assistance to transfer lessons learned; and to enhance local capabilities for planning, evaluation, and health systems research.

The Urban MCH-FP Extension Project of ICDDR,B is responsible for managing the

operations research, dissemination, and technical assistance aspects of the project. The CWFP, the Ministry of Health and Family Welfare (MOHFW), the Dhaka City Corporation (DCC), and the private sector will continue to manage the service aspects. The DCC, with technical assistance from the Urban Extension Project, is taking a lead role in developing a mechanism for local level planning and coordination.

Combined family planning and MCH services are being developed initially in Zone 3 of the DCC, which will serve as the experimental area. In addition, the project will provide technical assistance to transfer lessons learned in other Zones of Dhaka city and in other urban areas.

Research and Technical Assistance

During August-December 1994, the Project completed the data collection for several studies of health and family planning needs and services in Zone 3. This included development of an Urban Panel Survey System in a sample of the Zone 3 population and developed various mechanisms for collaboration, coordination and policy change.

Urban Panel Survey (UPS)

Pls: A.H. Baqui, R.I. Ahsan, Z. Quayyum, S.E. Arifeen, S. Nurani, R. Islam and N. Begum

A Panel Survey System is being developed in a probability sample of Zone 3 households. The two broad purposes of the UPS are: (a) to provide the required information for designing interventions through in-depth exploration of selected issues; and (b) to provide data to monitor and evaluate the project's interventions, including validation of the routine MIS statistics.

The UPS sample has been drawn based on a multi-stage areal sampling method. Separate slum and non-slum samples were drawn from each of the three intensive areas of the project (Ward 48, Ward 58, and Ward 65) and from the large non-intensive area (the rest of Zone 3). The sampling units are clusters of an average size of 40 households. There are 160 clusters and about 6,000 households under surveillance. A baseline survey was conducted between September and December of 1994. Besides basic socio-demographic and economic data, detailed information on the use of contraception was collected.

Needs Assessment Studies

Pls: S.E. Arifeen, S. Mookherjee, A. Begum, S. Amin, M.A. Quayyum, J. Begum, S. Jahan and A.H. Baqui

Qualitative study to identify the family planning service needs of low-parity and newly-wed couples

Sixteen focus group discussions were carried out in Zone 3 of Dhaka city with groups of newly-wed, non-contracepting young men and women, and with low-parity (1-2 children), non-contracepting young men and women from slum and non-slum areas. Information from these focus groups will be used: (a) to assess the health and family planning needs of these sub-populations whose needs are likely to be different; and (b) to identify potential family planning and MCH service interventions. These interventions will be tested in Zone 3 to better address the needs of the newly-weds and low-parity couples in slum and non-slum areas.

Survey of pharmacies and pharmacy staff

Pharmacies are an important source of family planning and health services, especially in the urban areas. This survey was designed to assess the current role of pharmacies and pharmacists/retailers in the provision of family planning and MCH services in the urban setting and to identify potential interventions that could strengthen or broaden the role of pharmacies in MCH-FP service delivery. About 100 pharmacies in Zone 3 were surveyed. These were randomly selected from a list of pharmacies obtained from the Social Marketing Company.

Survey of current contraceptive users who use pharmacies as sources of supply

This survey was designed to determine the

reasons for using pharmacies as source of contraceptive supplies and to assess the client's satisfaction with services received at pharmacies based on costs, information received, availability of services, and need for additional services. About 150 pharmacy users identified from the baseline survey were surveyed.

Assessment of MCH and family planning service delivery points

Thirty-five GoB and NGO health and family planning clinics, satellite clinics, dispensaries and hospitals in Zone 3 were assessed. A detailed inventory of each centre was made. Wherever available, two service providers at each of these health and family planning centres were interviewed. At least four observations of provider-client interactions (interpersonal relations) were carried out at each of the service delivery points. Exit interviews were conducted with all the clients observed. The data will be used: (a) to identify the needs and constraints to the service delivery points in Zone 3, and (b) to design and test interventions to improve the quality of clinical care.

Assessment of family planning field workers

All the family planning field workers (FW) in Zone 3 were interviewed and assessed (52 CWFP and 5 GoB). At least two observations of provider-client interactions were carried out of each FW. All of the clients observed were independently interviewed. The data will be used: (a) to identify the issues related to the field worker service delivery system that needs to be improved, and (b) to design and test interventions to increase the effectiveness of the field worker system.

Mechanisms for Collaboration, Coordination, and Policy Change

Since the primary purpose of this collaborative project is to improve the MCH-FP service delivery systems for the urban populations of Dhaka and other urban areas in Bangladesh, particularly the poor, the Ministry of Health and Family Welfare (MOHFW) and the Ministry of Local Government, Rural Development and Cooperatives (MOLGRDC), and the Dhaka City Corporation (DCC) are the most important partners of the project. The project continuously seeks the input and guidance of these government bodies in the formulation of its agenda. A National Task Force headed by the Secretary, Local Government Division, has been formed. It met for the first time in October 1994, and provided valuable policy guidance and inputs. It will convene every three months. In addition, at the operational level a Dhaka City Corporation Health and Family Planning Coordination Committee and a Zone 3 Coordination Committee have been formed to develop the capacity for local level planning and coordination of health and FP services and to strengthen the capacity of local government bodies to take up the responsibility for monitoring and coordinating the health and family planning services in Dhaka City.

Maternal and Child Health Studies
PIs: G. Antelman, S.E. Arifeen
and N. Fronczak
Funding: USAID and the Netherlands Government

The MCH Studies are a combination of three protocols which continued to be carried out by the Urban Extension Project during 1994.

By December 1994, over 1,600 pregnant women were enrolled, and over 1,000 births included in the study. The sample was drawn from the clusters of the Urban Surveillance System. During an enrollment period of 14 months, all pregnant women in these clusters were eligible for the study. Women were enrolled during the second trimester, visited twice during pregnancy, once within 72 hours of birth, and again at 1 week and 2 weeks postpartum. The infants are followed up at 1, 3, 6, 9, and 12 months of age.

Population Studies Centre
Director: R. Bairagi

The Population Studies Centre (PSC) is the nucleus of population studies of ICDDR,B, although other units, projects and programmes of

the Centre do operational and applied population research on this subject. The PSC takes advantage of the unique population data and field setting in Matlab and other demographic surveillance areas of the Centre, for basic scientific and methodological work, of national and international importance. The PSC prefers working with the unusual and uncommon data available in the unique field setting which is provided by Matlab.

The PSC organizes a monthly population seminar at which the results of significant studies are presented by the scientists of ICDDR,B and other national and international organizations to planners, policy-makers, and researchers of the GoB, NGOs, and other national and international organizations.

The PSC engaged in helping scientists from all Divisions of ICDDR,B in experimental design of studies, determination of sample size, statistical tests and interpretation of data. It also helped many national and international organizations on their demographic and statistical studies.

The following research projects were undertaken or completed in 1994:

Evaluation of the Bangladesh 1993-4 Demographic and Health Survey within the Matlab Demographic Surveillance System
PI: R. Bairagi
Funded by: Macro International and USAID Project Development Fund (PDF)

Most developing nations rely on surveys to provide data for the estimation of levels and trends of fertility and child mortality. Response errors in such data can be considerable. A validation study for the Bangladesh Demographic and Health Survey (BDHS) of 1993-1994 is currently underway.

The Demographic Surveillance System (DSS) in Matlab provided a unique opportunity to evaluate survey methodology and results of BDHS. BDHS interviewers enumerated 17,386 people in 3,250 households in the Matlab DSS area and 250 households in eleven adjacent non-DSS villages. The latter were done to allow tests for possible "contamination", i.e. better reporting by women in the DSS area because of the presence of vital registration there. Levels and trends of fertility, child mortality and contraceptive use from the survey data will be compared with the actual levels and trends from the vital registration data and determinants of errors will be investigated.

The Johns Hopkins University and the East-West Center are involved in this project. USAID has expressed interest in supporting the analysis of the data of the project.

Discrimination against female children in Bangladesh
PI: R. Bairagi
Funded by: UNICEF

In Bangladesh, preference of sons to daughters is very strong. This project is undertaken to investigate the levels and trends of discrimination against female children in several rural areas, with some variations in socioeconomic and demographic situations, and a few slum areas of Dhaka city, and the relationship of discrimination with fertility and mortality levels.

Some results of this project were presented in the workshop "Issues related to sex preference for children in the rapidly changing demographic dynamics in Asia" sponsored by UNFPA and Korea Institute of Health and Social Welfare in Seoul, S. Korea.

Child Survival Monitoring
PI: R. Bairagi
Funded by: UNICEF

In this project, alternative strategies for data collection for estimating child survival are examined. The previous birth technique (PBT) is used, in which the only information needed from mothers having a second or higher-order birth is whether their previously live-born child is alive or dead at the time of current delivery. It is shown that the PBT successfully identifies socioeconomic, sex and other mortality differentials. It also satisfactorily describes short-term variations in child mortality. In Bangladesh, the best source of data for the application of the PBT appears to be the EPI centre. This project was started in 1993 and continued up to March 1994.

Grameen Bank
PI: M. Rahman
Funded by: Rockefeller Foundation

The objective of this project is to investigate whether Grameen Bank (GB) activities in Bangladesh lead to any change in the life of participating women, particularly in fertility and contraceptive use. The project was completed in 1994. It found that the Grameen Bank has important effects as measured by marital stability, hygienic practices, decision-making, purchasing power, and other empowerment indices. Fertility is significantly lower among GB members than among non-members, other factors being the same. Several papers from this project are being prepared, one of which will be presented at the 1995 Population Association of America.

Computer Information Services

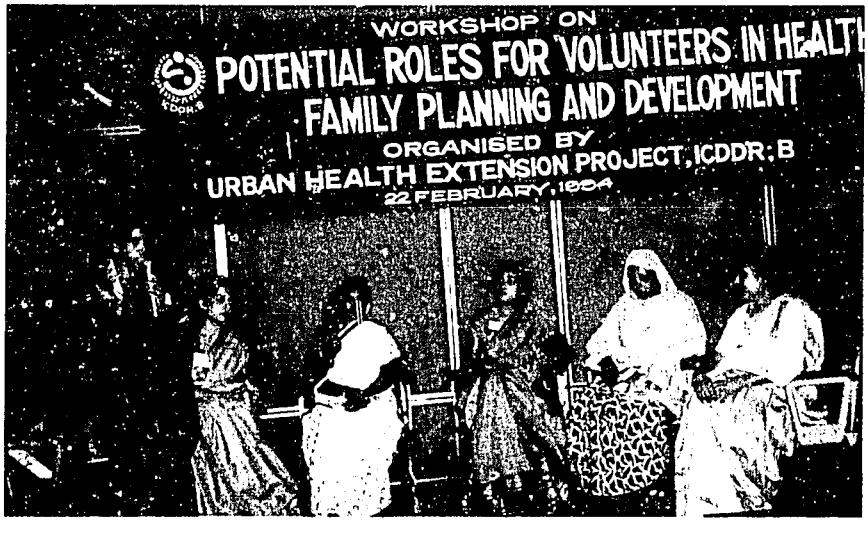
Acting CIS Manager: S. Begum
Funding: Core funds and Project funds

The Computer Information Services (CIS) branch has augmented its services by offering more facilities to the ICDDR,B's computer users in 1994.

The new e-mail service was installed in mid-November 1994. This UUCP connection needs a host computer system linked to Internet, to distribute all the outgoing mail to the destination and incoming mail to ICDDR,B. Currently, AITNET of the Asian Institute of Technology (AIT), Bangkok is acting as this host system. CIS dials into the AIT host twice a day to upload and download the e-mail. The users come to CIS to read and send their e-mail. Currently there are 65 e-mail users who find this recent medium of communication very useful.

CIS also has procured Local Area Network (LAN) equipment comprised of one server computer and two client computers. This LAN system will be used to develop and test the computerized application systems for other areas. An application development team, with members from both CIS and the Personnel Branch has designed the first stages of the Personnel Management System (PMS) on LAN environment. The physical design and development will be started soon using the LAN in CIS. A consultant team from Regional Computer Centre (RCC), AIT, Bangkok has provided CIS with suggestions and technical assistance for these activities, part of the Information Technology (IT) Implementation Plan submitted by the consultant team in April.

The purpose of the IT strategy planning is to identify, procure or develop, and implement the appropriate computer technology and systems at ICDDR,B to provide computer services related to health and population research activities and to establish a modern communication system with other parts of the world. To help achieve this goal, the Computer Engineer was sent to a training



Mohammed Ishaque

Speakers at a UHEP workshop in Dhaka

course on Data Communication and Networking at the Regional Computer Centre (RCC), AIT, Bangkok, Thailand during September - November, 1994.

Data Archiving Unit

Head: M.A. Kashem Shaikh
Donor: ODA

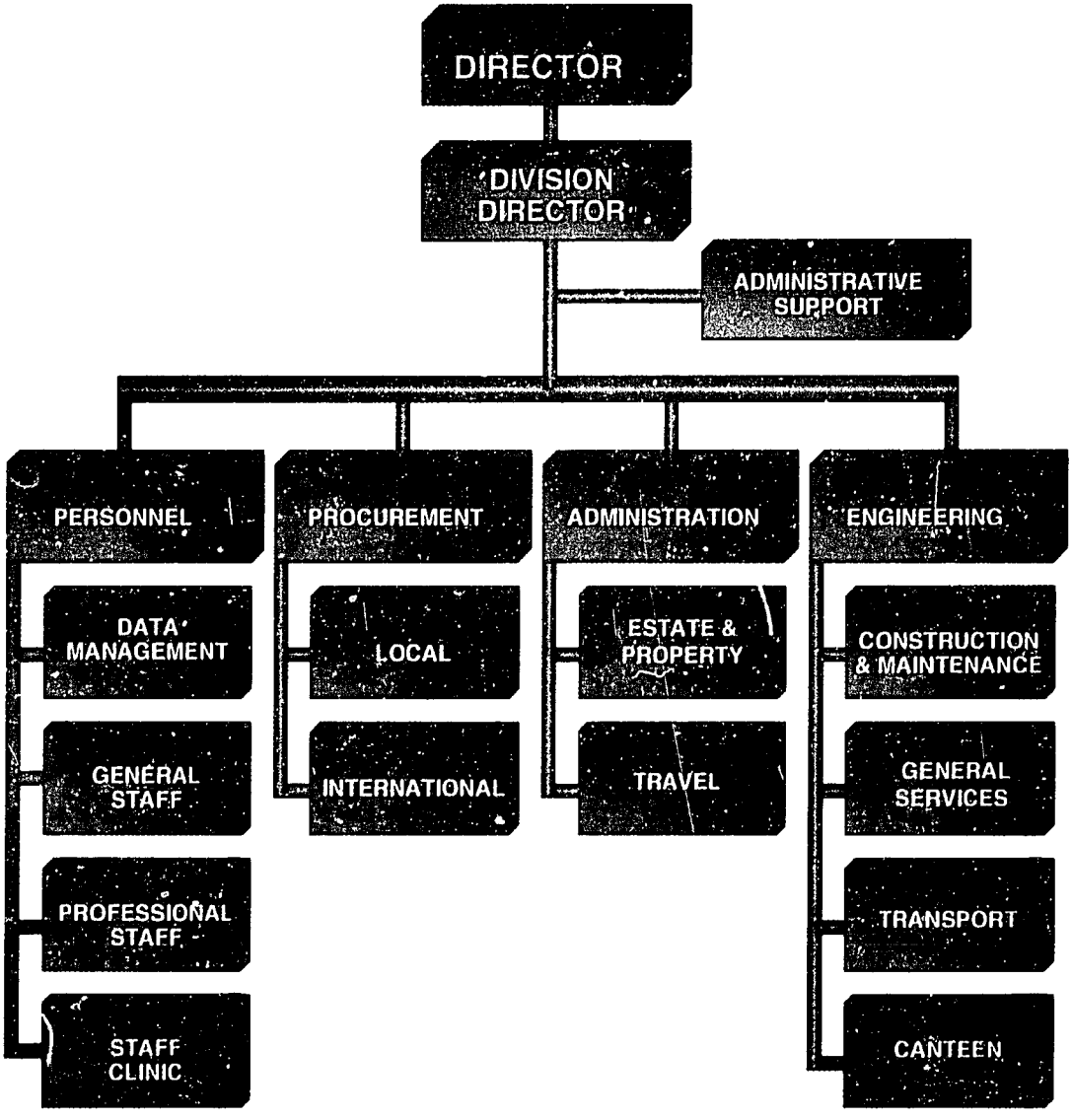
The Data Archiving Unit stores many of the data sets collected in the past by ICDDR,B and distributes them to various researchers both inside and outside the Centre. It currently archives over 1,241 files from 91 studies; 14 were added in 1994. Data sets were provided to ICDDR,B researchers, students in Bangladesh working on their dissertations, and scientists in this country and abroad. Work continued on improving the documentation of these data sets and providing easy access.

Population dynamics in the Matlab treatment area (served by the Centre's MCH-FP Programme) and the Matlab comparison area (served by the government health services)

Vital rates (per 1,000)	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993[a]
Crude birth rate													
Treatment area	35.3	36.9	34.2	30.7	34.6	33.6	33.6	30.9	28.4	28.3	25.4	25.4	24.4
Comparison area	43.8	44.7	42.6	37.3	42.6	39.6	39.2	40.4	36.6	37.8	32.7	31.1	29.5
Total fertility rate[b]													
Treatment area	4.8	5.0	4.5	4.0	4.5	4.3	4.2	3.8	3.4	3.4	3.0	3.0	2.9
Comparison area	6.3	6.3	6.1	5.1	6.0	5.5	5.4	5.4	4.9	5.0	4.3	4.0	3.9
Crude death rate													
Treatment area	11.9	12.5	11.9	13.4	10.2	9.9	9.3	8.7	8.0	7.6	8.1	8.3	7.6
Comparison area	14.4	15.9	16.7	17.3	14.2	12.2	11.2	11.0	9.5	9.4	10.2	9.8	10.1
Neonatal mortality rate[c]													
Treatment area	66.4	58.1	56.4	57.9	52.5	45.4	43.8	42.8	46.0	47.8	47.7	49.6	42.2
Comparison area	69.5	68.1	70.3	71.4	69.4	53.0	54.9	57.7	52.7	53.3	63.2	53.3	63.7
Post-neonatal mortality rate[c]													
Treatment area	36.1	47.5	41.8	56.9	33.8	36.4	34.6	38.0	28.3	27.4	32.3	30.8	20.1
Comparison area	45.0	50.2	42.2	55.7	49.1	39.7	39.5	39.0	38.0	34.1	51.7	37.0	35.1
Infant mortality rate[c]													
Treatment area	102.5	105.6	98.2	114.8	86.3	81.8	78.4	80.8	74.3	75.2	80.0	80.5	62.3
Comparison area	114.5	118.3	112.5	127.1	118.5	92.7	94.4	96.7	90.7	87.5	114.9	90.2	98.8
Child mortality (1-4 yr) rate													
Treatment area	19.1	18.8	21.9	23.1	16.4	13.4	9.9	7.6	6.4	5.3	7.0	5.9	6.0
Comparison area	24.8	27.4	35.3	[illegible]	24.6	20.7	15.0	14.4	11.5	9.3	9.1	10.4	9.7
Rate of natural increase													
Treatment area	23.4	24.3	22.3	17.3	24.4	23.7	24.3	22.1	20.4	20.7	17.3	17.1	1.7
Comparison area	29.4	28.8	25.8	20.0	28.4	27.4	28.0	29.4	27.1	28.4	22.5	21.2	1.9

[a]Provisional data
[b]Per woman
[c]Per 1,000 live-births

ADMINISTRATION & PERSONNEL DIVISION



ADMINISTRATION AND PERSONNEL DIVISION

Division Director : M.A. Mahbub

Divisional Highlights

- Strategy for Separation of Staff by Mutual Agreement introduced.
- Monthly Health Education Seminars organized by Staff Clinic for the ICDDR,B staff and their families.
- Replacement of old LT Feeder Cable from electrical substation to hospital building to ensure uninterrupted power supply to hospital and laboratories.
- Five new vehicles added to ICDDR,B fleet.
- Partially contracted out the transport, cleaning and security services to third parties.
- Uniform gate pass for movement of material and property introduced.

The Administration and Personnel Division is responsible for optimum utilization of the human and physical resources of the Centre to best achieve the Strategic Plan in regard to research, training and service objectives of the Centre. The Division maintained liaison with the host government and obtained their support in respect to administrative, legal, and financial matters concerning the Centre. The Division comprises four branches: Personnel, General Administration, Engineering, and Procurement.

Personnel Branch

Personnel Office
Chief Personnel Officer: Wahabuzzaman Ahmed

The Personnel Branch is responsible for organizing and administering the human resources of the Centre to meet its objectives as outlined in the Strategic Plan. At the end of 1994, the Centre had 986 staff plus 155 Community Health Workers and 90 Health Workers. There were 31 International staff, 13 of whom were on secondment, 160 National Officers and 779 in the General Service category. The staff strength was reduced by 1.4% compared to that of the previous year.

New Professional Staff

Dr. Shameem Ahmed (Bangladesh) joined the Rural MCH-FP Extension Project as the Health Scientist in October in a 3-year International Professional Fixed-term position. Before joining ICDDR,B, Dr. Ahmed was the Associate Professor, Nutrition and Gastroenterology in the Department of Paediatrics, Institute of Post Graduate Medicine & Research.

Mr. Syed Shamim Ahsan (Bangladesh), recently retired as Secretary, Ministry of Health and Family Welfare, Government of Bangladesh, joined the Centre on 1 December 1994 as Advisor to the MCH-FP Extension Project (Rural and Urban), on secondment from the Population Council for one year.

Dr. Abdullah H. Baqui (Bangladesh), Project Director of the Urban MCH-FP Extension Project, completed his 3-year term of service in an International Professional Fixed-term position. Thereafter, he joined in November, seconded from the Johns Hopkins University, in the same position.

Dr. Barkat-e-Khuda (Bangladesh), seconded by the Population Council, joined the Centre in May as the Project Director, Rural MCH-FP Extension Project. Prior to joining ICDDR,B, Dr. Khuda was Professor and Chairman of the Department of Economics, Dhaka University.

Dr. Mihir Kumar Bhattacharya (India) joined the Centre on 15 August 1994 as an international Research Fellow under the Health Research Training Programme in the Clinical Sciences

Division for 1-2 years. He is from the National Institute of Cholera and Enteric Diseases (NICED), Calcutta.

Dr. Abbas Uddin Bhuiya (Bangladesh) joined as an International Fixed-term Professional in July as the Project Director of the "Improvement of Health through Community Development-oriented Programme in Rural Bangladesh" project under the Community Health Division.

Dr. George Fuchs (USA) joined the Clinical Sciences Division as Senior Scientist in November on secondment from the Louisiana State University for a period of 3 years. Dr. Fuchs was invited by the Centre twice during the year to provide consultancy services. Dr. Fuchs was in Chiang Mai, Thailand, as Visiting Professor at the Research Institute for Health Sciences, Chiang Mai University.

Dr. Sarah Hawkes (UK) joined ICDDR,B in October as Assistant Scientist and PI of the protocol entitled "Reproductive tract infection study" in the MCH-FP Project, Matlab. Prior to joining this post, she was invited by the Centre for 10 days as a Consultant to make an estimate of the requirements for the RTI protocol and to start modifications on the draft.

Dr. M.A. Khaled (USA), Associate Professor, Public Health Sciences, University of Alabama at Birmingham (USA) joined the Centre in June in the area of micronutrient and child health in the Clinical Sciences Division. Dr. Khaled is on secondment from the University of Alabama at Birmingham for a period of 2 years.

Dr. Simon Ling (UK), a Research Fellow from the Department of Child Life and Health, University of Edinburgh, joined the Centre in November as a Co-Investigator in a project "Diarrhoeal disease, nutrition and catch-up growth in Bangladesh" undertaken with the University of Edinburgh.

Dr. James L. Ross (USA), formerly working with the Ford Foundation, joined the Centre in January as Senior Scientist, Social and Behavioural Sciences for a period of 3 years. He has been seconded by the London School of Hygiene & Tropical Medicine.

Dr. Telahun Teka, Associate Professor, Department of Paediatrics of the Gondar College of Medical Sciences, Gondar, Ethiopia joined the Centre on 1 October 1994 as an International Health Research Training Fellow under the Health Research Training Programme in the Clinical Sciences Division. Dr. Teka will be at the Centre for 1-2 years.

Dr. Cristobal Tunon (Panama) joined as an International Fixed-term Professional in December as the Management Scientist in the Urban MCH-FP Extension Project for a period of 3 years. Dr. Tunon was a Project Officer, H&N Section with UNICEF, Dhaka.

Mr. Graham A. Wright (UK), who served the Centre as Consultant on a number of occasions, joined in January as the Assistant Director, External Relations and Institutional Development, initially for 3 years. This is an International Professional Fixed-term position.

Consultants

Dr. Charoon Chirapaisarnkul, Executive Director; **Dr. Agus Harianto**, Manager, Systems Operations; **Mr. Nesar Uddin Bhuiyan**, Systems Analyst; **Mr. Rizaldo B. Garingal**, Asian Institute of Technology, Thailand, visited ICDDR,B to help prepare an information technology strategy for the Centre.

Dr. R.E. Black, Professor and Chairman, Department of International Health, Johns Hopkins University School of Hygiene and Public Health, Baltimore, USA, spent one week in September and another week in December and assisted in setting project priorities and with the needs assessment studies.

Dr. Felicity Cutts, Senior Lecturer of Epidemiology at the London School of Hygiene & Tropical Medicine, was invited briefly by the Clinical Sciences Division to review the progress of the ongoing project entitled "A study of the importance of nosocomial transmission of measles and validation of salivary IgM assay for diagnosis of recent measles infection."

Mr. Kazi Serajul Hossain, Govt. Liaison Consultant, joined as consultant on 22 August 1994.

Dr. Diana Jean Jupp (UK) visited the Centre to provide consultancy for the AIDSCAP Workshop in the Community Health Division for 4 months.

Dr. Thomas T. Kane, Assistant Professor, Department of Population Dynamics, School of Hygiene and Public Health at the Johns Hopkins University, USA, spent a month at the Centre during September-October and assisted with the design of the needs assessment studies.

Dr. Pentti J. Pelto, Professor, University of Connecticut, spent several months as a consultant to the Social and Behavioural Sciences Programme, and provided invaluable technical assistance in both programme and staff development.

Dr. G. Riethmuller (Germany), Professor, Institut fur Immunologie der Universitat Munchen, visited for a week as a consultant to assess the Laboratory Sciences Division in November.

Mrs. Josephine A. Sack (USA) was again invited by the Centre to provide consultancy services as Editorial Advisor, DISC. She edited the Centre's 1993 Annual Report and assisted with the preparation of three issues of "GLIMPSE."

Ms. Rosie Shier (UK), from the Tropical Health Epidemiology Unit, London School of Hygiene & Tropical Medicine, provided a consultancy to assist in analysis and interpretation of data in the Environmental Health Programme of the Community Health Division.

Mr. Imre Soos (Hungary), Personnel Officer from WHO, returned to the Centre in June to provide consultancy services to the Administration and Personnel Division.

Departure

Dr. R. Bradley Sack (USA), Division Director of the Community Health Division and Laboratory Sciences Division, returned to the United States after serving the Centre for four years. He had been seconded by the Johns Hopkins University. During the month of October and again in December, Dr. Sack was invited by the Centre as a Consultant to guide continuation of projects initiated during his tenure and to offer technical assistance to the Acting Division Directors of CHD and LSD.

Mrs. Judith A. Chowdhury (Australia), Executive Assistant to the Director, left after completing her 6-year International Professional Fixed-term assignment.

Dr. M. Moyenul Islam (Canada), Research Pathologist of the Laboratory Sciences Division, completed his 6-year International Professional Fixed-term assignment and left the Centre in July.

Dr. John Haaga (USA), seconded by the Population Council, left the Centre in early January after completing his 2-year assignment as the Project Director of MCH-FP Extension Project (Rural).

Dr. Kanta Jamil (Bangladesh), Demographer/Social Scientist in the MCH-FP Extension Project (Urban) resigned in May. Dr. Kanta Jamil served the Centre for over a year on an International Professional Fixed-term assignment. She was seconded by the Johns Hopkins University.

Dr. Hiroaki Miura (Japan), Visiting Scientist in the Laboratory Sciences Division, seconded by the Japan International Cooperation Agency (JICA), left the Centre in March after completing one year of service.

Mr. Abdullah Hel Mostafa (Australia), Computer Information Systems Manager, left the Centre in January after completion of his 6-year International Professional Fixed-term assignment.

Dr. Carlos Seas (Peru), Health Research Fellow in the Clinical Sciences Division, completed his fellowship programme in March and returned to the Universidad Peruana Cayetano Heredia in Peru.

Dr. Eugene Weiss (USA), seconded by the Johns Hopkins University, Operations Research Advisor to the Urban MCH-FP Extension Project, returned to the United States after working with ICDDR,B for 1 year.

Dr. Sushila J. Zeitlyn (UK), Social Anthropologist in the Community Health Division, resigned in May after two-year service to join the Overseas Development Administration (ODA) in Malawi.

Visitors

The following are some of the many distinguished visitors who came to observe the activities of the Centre:

Addis Ababa University, Ethiopia: Dr. Pawlos Quana'a; **Aga Khan Foundation, Geneva**: Dr.

Asem Ansari

Indian High Commissioner in Bangladesh H.E. Mr. K. Raghunath seeing conditions of patients in the Centre's Dhaka hospital

Ronald Wilson; **Aga Khan Foundation, Paris**: Dr David Fraser; **AIDSCAP, Bangkok, Thailand**: Ms. Mrudula G. Amin, Communication Officer, Mr. Tonny Bannet, Senior Programme Officer, Dr. Chalintorn Burian, Regional Training Officer; **Al-Azhar University, Bab El-Sha'reya Hospital, Cairo, Egypt**: Professor Mahmoud El-Mougi; **Albert Einstein Medical Center, New York, USA**: Dr. Sabrina Islam; **All India Institute of Medical Sciences, New Delhi**: Dr. M.K. Bhan; **Andean Rural Health Care. Lake Junaluska, NC, USA**: Henry B. Perry III; **The Asia Foundation, San Francisco, USA**: Mr. Richard H. Fuller, Regional Director, South/Southeast Asia; **Asian Development Bank, Metro Manila, Philippines**: Dr. Jeremy Bird, Dr. Vincent P.J. De Wit, Dr. Benjamin P. Loevinsohn, Mr. S.J. McCormick; **Asian Institute of Technology, Bangkok, Thailand**: Dr. Charoon Chirapaisarnkul, Executive Director, Regional Computer Centre; **Australian High Commission, Dhaka**: H.E. Mr. Kenneth W. Aspinall, High Commissioner, Ms. Fabia Shah, First Secretary; **Australian International Development Assistance Bureau, Canberra, Australia**: Mr. (and Mrs) Philip Flood, Director General; **Basic Support for Institutionalizing Child Survival, Arlington, USA**: Dr. Diana R. Silimperi, Dr. R. Waldman, Dr. Bob Wareback; **Bassett Health Care, Cooperstown, New York, USA**: Dr. Chris Kjolhede; **Bath University, UK**: Dr. David Lewis; **Bose Institute, Calcutta, India**: Professor A.C. Ghose; **BBC Television, London, UK**: Ms. Vivian Morgan; **British High Commission, Dhaka**: H.E. Mr. Peter J. Fowler CMG, High Commissioner, Dr. Mehtabunisa Currey; **Canadian High Commission, Dhaka**: H.E. Mr. (and Mrs) Jon J. Scott, High Commissioner; **Canadian High Commission, Singapore**: Dr. George A. Giovinazzo, Overseas Health Programme (OHP); **Canadian International Development Agency, Canada**: Ms. Marie-Josee Posen, Director General; **Centers for Disease Control and Prevention, Atlanta, Georgia, USA**: Dr Roger Glass; **Columbia University, New York, USA**: Dr. Joe Wray; **Dagens Nyheter, Sweden**: Ms. Eva Hernback, Staff Reporter; **Department of State, USA**: Mr. Timothy M. Carney, Deputy Assistant Secretary; **East-West Center, Honolulu, USA**: Professor Andrew Katner; **Embassy of Japan, Dhaka**: H.E. Mr. Shigeo Takenaka, Ambassador; **Embassy of Switzerland, Dhaka**: H.E. Mr. (and Mrs) Albert Mehr, Charge d'Affairs; **Embassy of the United States of America, Dhaka**: H.E. Mr. David N. Merrill, Ambassador; **European Union, Dhaka**: Mr. Nick Roberts, Counsellor; **The Ford Foundation, Dhaka**: Mr. Raymond C. Offenheiser, Representative; **Kantonsspital, Basel, Switzerland**: Professor Klaus Gyr; **Government of India**: Dr. Joysree Gupta, Deputy Secretary, Dr. K.C. Tayal, Assistant Commissioner; **Harvard Institute for International Development, Cambridge, Massachusetts, USA**: Dr. Richard A. Cash, ADDR; **The Herald Tribune, UK**: Mr. John Anderson; **The Hindustan Times, New Delhi**: Mr. Pankaj Tuli, Sub-Editor; **Indian High Commission, Dhaka**: H.E. Mr. K. Raghunath, High Commissioner; **Indian Institute of Management, Bangalore**: Dr. Jagdish C. Bhatia; **Indian Public Affairs Network, New Delhi**: Mr. Rakesh Thukral; **Infectious Diseases Hospital, Calcutta, India**: Dr. K.P. Das, Superintendent; **Institut fur Immunologie der Universitat**

Munchen, Munchen, Germany: Professor Gert Riethmuller; **Institute of Child Health, UK**: Dr. Anthony Costello; **Institute of Public Health, Medical Research Council, Cambridge, UK**: Dr. Sheila Gore; **Interdisciplinary Demographic Institute, The Netherlands**: Dr. Jeroen van Ginneken; **International Development Research Centre, Ottawa, Canada**: Dr. Anwar Islam, Senior Program Officer; **International Development Research Centre, Singapore**: Dr. Wilfredo A. Reyes, Regional Controller; **International HIV/AIDS Alliance, UK**: Ms. Susan Crane, Consultant, Dr. S. Sundararaman, Consultant; **Japan Times, Tokyo**: Mr. Asako Murakami, Staff Writer; **The Johns Hopkins University, Baltimore, USA**: Professor Stan Becker, Professor R.E. Black, Department of International Health, Professor Kenneth Hill, Mr. Gary Saffitz, Communication Consultant, Dr. Mathuram Santosham, Dr. Mark C. Steinhoff, Dr. Rebecca Stoltzfus, Dr. K.P. West, Dana Centre for Preventive Ophthalmology; **Karolinska Institute, Stockholm, Sweden**: Dr. Roland Mollby, Department of Bacteriology, Dr. Bengt Wretlind; **KIT, The Netherlands**: Professor Peter Streefland, Department of Primary Health Care; **Kuwait University**: Dr. Abdul Majid Molla; **London School of Hygiene & Tropical Medicine, UK**: Professor John Blacker; Mr. Simon Cousens, WHO Consultant, Dr. Felicity Cutts, Professor (and Mrs) Richard Feachem, Dean, Ms Vicky Hosegood, Professor David Mabey, Dr. Patrick Vaughan; **Louisiana State University Medical School, New Orleans, USA**: Dr. Robert M. Suskind, Pediatric Department; **McGill University, Montreal, Canada**: Professor J.R. Hamilton; **The Mainichi Newspaper, Tokyo, Japan**: Mr. Takaaki Ishikawa, Staff Writer; **Merck Sharp and Dohme Laboratory, USA**: Dr David Nalin; **Millennium Institute, Arlington, VA, USA**: Dr. Gerald O. Barney, Founder and Executive Director; **Ministry of Health and Family Welfare, Government of India**: Dr. J. Sokhey; **National Heart and Lung Institute, London, UK**: Professor J. Corbett McDonald; **National Institute of Cholera and Enteric Diseases, Calcutta, India**: Dr. B.K. Sircar, Deputy Director, Epidemiology Branch; **Overseas Development Administration, London, UK**: Mr. Andrew Cenus; **Pennsylvania State University, USA**: Professor Patricia Lyons Johnson, Associate Professor; **RAND Corporation, USA**: Dr. Omar Rahman; **Royal Embassy of Belgium, Bangkok, Thailand**: Dr. Daniel Ceuninck, Medical Cooperation Attache; **Royal College of General Practitioners, London, UK**: Professor D.G. Garvie; **Ruprecht-Karls-University, Heidelberg, Germany**: Dr. Madeleine de Rosas-Valera, Department of Health; **Satellite Television Asian Region Ltd., Hong Kong**: Mr. Phil Jones, Producer, Mr. John Morehead, Presenter; **Saturday Times, Bombay, India**: Ms. Amy Fernandes, Editorial Coordinator; **Swedish Agency for Research Cooperation, Stockholm, Sweden**: Ms. Hellen Ohlin, Research Officer; **Swiss Development Cooperation, Dhaka**: Dr. Peter Arnold, Mr. Philippe Besson, Mr. Ruedi Dannecker; **Tokushima Bunri University, Yamashiro, Japan**: Professor Keinosuke Okamoto; **UNDP, New York, USA**: Dr. Seung-il Shin, Senior Health Adviser; **UNFPA, Kathmandu, Nepal**: Dr. P.M. Jesse Brandt, Country Support

Asem Ansari

Japanese Ambassador in Bangladesh H.E. Mr. Shigeo Takenaka presenting a cheque to the Director Dr. Demissie Habte during his visit to the Centre

Mr. Philip Flood, Director General of AIDAB and his wife being briefed about the hospital facilities and treatment pattern during their visit to the Centre

Graham Wright

Team; **UNICEF, New York, USA**: the late Mr. James P. Grant, Executive Director, Dr. Kul Gautam, Director, Operations, Dr. Monica Sharma, Senior Adviser, CDD/ARI; **UNICEF Regional Office, New Delhi**: Dr. Jon Rohde, Representative; **Universidad Peruana Cayetano Heredia, Lima, Peru**: Dr. E. Chea-Woo; **The University of Alabama at Birmingham, Alabama, USA**: Dr. J.O. Alvarez; **University of Goteborg, Sweden**: Dr. Christine Wenneras; **University of London, UK**: Professor Donald S. McLaren, Institute of Ophthalmology; **University of Maryland, USA**: Dr. Rita R. Colwell; **University of Minnesota, Minneapolis, USA**: Dr. Norben Hirschhorn; **University of Pennsylvania, USA**: Dr. Jane Menken, Professor and Director, Population Studies Center; **University of Tampere, Finland**: Dr. T. Vesikari; **University of Virginia, USA**: Professor William A. Petri; **University of Western Australia, Perth**: Dr. Peter Underwood; **USAID, Dhaka**: Mr. Richard M. Brown, Mission Director, Mr. William J. Garvelink, Office of Foreign Disaster Assistance, Mr. Ali Noor, Chief, REM Unit; **USAID, Washington, D.C., USA**: Dr. Eunyong Chung, Research & Development Section, Dr. Frances R. Davidson, Acting Director, Office of Nutrition, Dr. Caryn Miller, Deputy Chief, Office of Health, Dr. Timothy Quick, Office of Nutrition, Dr. Carol Rice, Mr. Richard Murray Trostle; **The Washington Post, Washington, D.C., USA**: Mr. John Anderson; **World Health Organization, Dhaka**: Dr. Witjaksono Hardjonojo, Representative in Bangladesh; **World Health Organization, Geneva, Switzerland**: Dr. Fabrizio S.M. Bassani, Director, Division of Emergency and Humanitarian Action, Dr. O. Fontaine, Dr. N.F. Pierce, CDD Programme, Dr. J. Tulloch, Director, Division for Diarrhoeal and Acute Respiratory Disease Control, Dr. Barbara A. Underwood, Special Adviser on Vitamin A Programme; **World Health Organization, Regional Office, New Delhi**: Mr. Georges Koulischer, Director, Support Programme; **World Maritime University, London, UK**: Mr. Bernard Zagorin, Senior Adviser to the Chancellor; **World Vision International, Asia Region, Singapore**: Dr. Sri Chander, Regional Health Advisor; Ms. Haleemath Zulfaree, Staff Nurse, Male, Maldives; **Mount Sinai Medical Center, New York, USA**: Dr. David B. Sachar; two former

Asem Ansari

Dr. David B. Sachar, Vice-chairman of the Department of Medicine at the Mount Sinai Medical Center in New York, examining sick children at the Centre's Dhaka hospital

directors of **ICDDR,B** Dr. W. Henry Mosley and Dr. Abram Benenson also visited the Centre.

Obituary

With deep sorrow we record the deaths of the following staff who have had many years of service with the Centre:
Mr. Farhad Hossain (45), Librarian, DISC. He served the Centre for 14 years; **Mr. Md. Abul Hashem** (43), Driver, Transport. He served the Centre for 17 years; **Mr. Kazi Md. Fazlur Rahman** (50), Security Guard, General Service Unit. He served the Centre for 20 years.

Retirement

The nine people who retired from the Centre during the year are:

Dr. A.S.M. Mizanur Rahman, Senior Medical Officer, Special Grade, Training Coordination Bureau, Director's Bureau; **Mr. Faizur Rahman**, Senior Laboratory Technician, Matlab Laboratory, I SD; **Mr. Abdur Razzak**, Senior Technical Officer, Maintenance Branch, A&PD; **Mrs. Rezina Rozario**, Aid Nurse, CRSC, CSD; **Mr. Abdul Aziz**, Maintenance Mechanic, A&PD; **Mr. Mofazalur Rahman**, Instrument Engineer, Bio-Medical Engineering Cell; **Mr. Didar Baksha**, Security Guard, MHRC, CHD; **Mr. Mohor Ali Mollah**, Security Guard, MHRC, CHD; **Mr. Michael Rozario**, Assistant Cook, Canteen, A&PD.

Separation by Mutual Agreement

Twenty-nine members of the staff who sought separation by mutual agreement were released during the year. They are:

Dr. Rezia Laila Akbar, Training Coordinator, Director's Bureau; **Mr. M. Golam Morshed**, Chief Supply Officer, A&PD; **Mr. Md. Shafiqul Islam**, Associate Scientist, CHD; **Dr. Meena Chowdhury**, Staff Clinic Physician Manager, A&PD; **Mr. Md. Nurul Huda**, Senior Publication Officer, DISC; **Mrs. Pankajini Biswas**, Nursing Officer, CRSC, CSD; **Mrs. Zebunessa Ghafur**, Assistant Trainer, Urban MCH-FP Extension Project; **Mr. A.H.G. Kader Chowdhury**, Administrative Assistant, Finance Division; **Mr. Moyeen Uddin Ahmed**, Animal Technician, ARB, LSD; **Ms. Carolina Datta**, Aide Nurse, Urban MCH-FP Extension Project; **Mr. Md. Abul Hossain Mazumder**, Clerk Gr-I, PFPD; **Mr. Shafar Uddin**, Head Gardener, GSU, A&PD; **Mr. Syed Ahmed Faruqui**, Security Foreman, GSU, A&PD; **Mr. Md. Faizuddin Mollah**, Driver, Urban MCH-FP Extension Project; **Mr. Nicholas Rozario**, Driver, Transport, A&PD; **Mr. Md. Alauddin**, Security Guard, GSU, A&PD; **Mr. Md. Taru Miah**, Security Guard, GSU, A&PD; **Mr. Noor Mohammad**, Security Guard, GSU, A&PD; **Mr. Md. Abdus Samad**, Security Guard, MHRC, CHD; **Mr. Md. Aminul Islam**, Security Guard, GSU, A&PD; **Mr. Chand Miah**, Security Guard, GSU, A&PD; **Mr. Joynal Abedin**, Security Guard, A&PD; **Mr. Iman Ali**, Cleaner, GSU, A&PD; **Mr. Banamali Das**, Cleaner, GSU, A&PD; **Mr. Ayub Ali**, Cleaner, GSU, A&PD; **Mr. Md. Abdul Khaleque**, Cleaner, CRSC, CSD; **Mr. Md. Shamsu Miah**, Cleaner, GSU, A&PD; **Mr. Md. Nurnuddin**, Gardener, GSU, A&PD; **Mr. Rafiqul Alam**, Cook Helper, Canteen, A&PD.

Long Service Award: 25 years

During 1994, six General Service staff completed 25 years of service in the Centre, and were awarded a pay increase for meritorious service. They are:

Mr. Monoranjan Das, Senior Health Assistant, DSS Matlab, PFPD; **Mr. Khalilur Rahman**, Senior Health Assistant, DSS Matlab, PFPD; **Mr. Md. Abdur Rashid Mia**, Senior Health Assistant, DSS Matlab, PFPD; **Mr. Md. Nurul Haque**, Foreman, Maintenance & Engineering, A&PD; **Mr. Didar Baksha**, Security Guard, MHRC, CHD; Mr. **Md. Lal Miah**, Speedboat Driver, MHRC, CHD.

Long Service Award : 30 years

During 1994, three National Officers and 37 General Service staff completed 30 years of service in the Centre, and were awarded a pay

increase for meritorious services. They are:

Mr. Md. Abdul Jabbar, Personnel Manager (GS), A&PD; **Mr. Md. A. Mazid Sarder**, Manager, DSS, Matlab, PFPD; **Mr. Md. Muzibur Rahman**, Scientific Officer, Biochemistry and Nutrition, LSD; **Mr. A.K.M. Nurul Islam**, Senior Field Research Officer, DSS Matlab, MHRC; **Mr. Abdus Sobhan Bepari**, Senior Laboratory Attendant, Matlab Clinical Microbiology, LSD; **Mr. Dinesh Chandra Saha**, Senior Health Assistant, Health Services, MHRC, CHD; **Mr. Sukha Ranjan Paul**, Senior Health Assistant, MHRC, CHD; **Mr. Abu Taher**, Senior Health Assistant, Matlab MCH-FP Project, CHD; **Mr. Md. Nasir Uddin**, Senior Health Assistant, MHRC, CHD; **Mr. Md. Joynal Abedin**, Mechanic, Administrative Service, MHRC, A&PD; **Mr. Tofazzel Hossain**, Foreman, Vehicles Maintenance, Maintenance & Engineering Branch, A&PD; **Mr. Azizur Rahman**, Pharmacy In-charge, CRSC, CSD; **Mr. Md. Mokbul Hossain**, Field Research Officer, Matlab MCH-FP Project, CHD; **Mr. A.K.M. Mozibul Hoque**, Administrative Assistant, DSS Matlab, PFPD; **Mr. Amir Ali Khan**, Ward Attendant, DTC, MHRC, CHD; **Mr. Md. Omar Ali Miah**, Laboratory Technician, Matlab Laboratory, LSD; **Mrs. Rumi Gomes**, Aid Nurse, CRSC, CSD; **Mr. Md. Khalilur Rahman**, Assistant Supervisor, DSS Matlab, PFPD; **Mr. Md. Shahjahan Mian**, Laboratory Technician, Virology, LSD; **Mrs. Lutfun Nahar**, Assistant Staff Nurse, CRSC, CSD; **Mrs. Shishu Bala Mali**, Cleaner, CRSC, CSD; **Mr. Asit Baran Saha**, Aid Nurse, MCRC, MHRC; **Mr. K. Shamsuddin Ahmed**, Maintenance Supervisor, Matlab Administrative Services, MHRC, CHD; **Mr. Abdur Rahman**, Security Guard, GSU, A&PD; **Mr. Abdul Hasan**, Senior Laboratory Attendant, Media/Washup, LSD; **Mr. Md. Ghyasuddin**, Research Officer, Clinical Biochemistry Section, LSD; **Mr. Siddiqur Rahman Patwary**, Health Assistant, MHRC, CHD; **Mr. Abdul Ghani**, Laboratory Technician, LSD; **Mr. S.M. Abdus Sattar**, Senior Store Officer, Administrative Services, MHRC, CHD; **Mr. Md. Idris Miah**, Health Assistant, DSS Matlab, PFPD; **Mr. Sekander Hayet**, Administrative Assistant, Administrative Services, MHRC, CHD; **Mr. Md. Zahirul Hoque**, Health Assistant, DSS Matlab, PFPD; **Mr. Abdul Baten**, Senior Health Assistant, MHRC, CHD; **Mr. Syed Rezaul Karim**, Laboratory Technician, Clinical Microbiology, LSD; **Mr. Md. Ismail**, Field Research Officer, DSS Matlab, PFPD; **Mr. Md. Nurul Hoque**, Health Assistant, DSS Matlab, PFPD; **Mr. Golam Hossain**, Health Assistant, DSS Matlab, PFPD; **Mr. Md. Idris Ali Miah**, Health Assistant, DSS Matlab, PFPD; **Mrs. Ful Rani Biswas**, Aid Nurse, CRSC, CSD; **Mr. Mukhlesur Rahman**, Field Research Officer, Rural MCH-FP Extension Project, PFPD.

Scientific Ranking

The following staff were promoted and ranked as noted against their names in recognition of sustained performance of exceptional merit and scientific achievement:

Dr. Mohammad Ali, Senior Medical Officer I, CSD, from Medical Officer; **Dr. Dewan Shamsul Alam**, Senior Medical Officer II, CHD, from Medical Officer; **Dr. Md. Nur Haque Alam**, Senior Medical Officer I, CSD, from Medical Officer; **Dr. A.S.G. Faruque**, Scientist, CSD, from Associate Scientist; **Dr. Md. Sirajul Islam**, Scientist, LSD, from Associate Scientist; **Dr. Rukhsana Haider**, Associate Scientist, CSD, from Assistant Scientist; **Dr. M. Aminul Islam**, Associate Scientist, CSD, from Assistant Scientist; **Dr. Md. Mujibur Rahman**, Associate Scientist, CSD, from Assistant Scientist; **Mr. Mian Bazle Hossain**, Demographer/Assistant Scientist, PFPD, from Statistician; **Dr. Kaiser Ali Talukder**, Assistant Scientist, LSD, from Research Officer; **Mr. Md. Golam Mostafa**, Research Fellow, PFPD, from Statistical Officer.

Staff Clinic

Physician Manager: Dr. Matiur Rahman

Health care facilities were provided to the staff and their dependants during 1994 by the Staff Clinic. In addition to the regular medical care services, the Staff Clinic introduced a Health Education Programme by organizing seminars every month given by specialists for the staff and their families. So far, 6 seminars were organized on

Hypertension, Diabetes Mellitus, Heart Attack, Viral Hepatitis, AIDS, and Antenatal Care. During the year, 24,858 patients were seen, 147 were hospitalized, 626 were emergency cases, 54 required surgery and 18 babies were delivered. 97 persons were also provided with family planning services.

Procurement Branch

Purchase Office

Manager: Mahbubul Alam

The Procurement Branch is responsible for the purchase of in-country and overseas equipment, supplies, vehicles, chemicals and reagents required by different areas of the Centre. This branch also provides logistic support to the scientific areas and attends to customs clearance for incoming and outgoing shipments.

In 1994, this branch received 16 items of laboratory equipment, including an incinerator for the Animal Resources Branch and a chemistry analyzer for LSD. It disposed of eight unserviceable vehicles and procured 10 new Toyota vehicles and outboard marine engines for Matlab.

Engineering Branch

Engineering Office

Engineering Manager: Taqsem A. Khan

The Engineering Branch provided engineering, maintenance and administrative support to run the research, training and service activities of the Centre. The Branch planned and executed all types of civil construction, installation and maintenance of electrical and mechanical equipment, devices, maintenance of buildings, roads and all physical facilities of the Centre.

This department supervised and coordinated security and cleaning services, transport and logistics support, vehicle maintenance and the staff canteen. It maintained liaison with government organizations like DESA, WASA, TITAS Gas Co., BRTA and some consulting firms.

Civil Engineering

Assistant Engineer: Rabindra Das

Repairs, painting, renovation and maintenance of about 130,000 sq.ft. of covered building area of ICDDR,B has been completed. The Engineering Branch installed automatic water pump controllers on all the water pumps of the Centre, which has reduced the manpower cost in operating water pump manually.

New offices for the Swiss Red Cross-funded project and the basic science research unit of the hospital were renovated. A fence was erected between the cross bar security post at the west side of the hospital and the CHP shed. The boundary wall of the Animal Resources Branch was raised to ensure security.

Electrical Engineering

Supervisor: Azizul Hoque

This section made great efforts to ensure an uninterrupted power supply to the Centre. It maintained one electrical sub-station consisting of 800 KVA transformer, 825 KVA Standby Generator set, HT and LT switch gears, etc. It also maintained all electrical equipment of the Centre, including 212 split-type air-conditioners, 270 window-type air-conditioners, and 220 refrigerators.

Following a major electrical power crisis due to failure of the old LT cables, new sets of cable were laid with the help of DESA for assurance of uninterrupted electrical power to the hospital and laboratories.

Vehicles Maintenance

Assistant Engineer: M.A.H. Talukder

The Vehicle Maintenance Workshop carried out repair and maintenance of the Centre's 57 vehicles and kept all the vehicles road-worthy. A total of 887 major and minor repairs was undertaken in 1994.

Staff Canteen

Canteen Supervisor: M. Abdullah

The Centre's Staff Canteen served lunch and tea twice a day for an average of 400 staff, as well as food for 200-400 patients and attendants. It also catered to various seminars, conferences and meetings of the Centre.

General Services

General Service Officer: A.M. Alamgir

This office provided security, cleaning, gardening, mail delivery, conference management and other services to the Centre. Significant improvement in services has been achieved during 1994.

A uniform gate-pass system was introduced for movement of materials. Several measures, including repair of new gates and fencing, and visitors' passes were introduced to strengthen security of different offices. New sign boards and location boards were made; road markings done; ID cards checking carried out; pavements and approaches improved; windshield stickers printed for the Centre's vehicles and staff vehicles for regulating entry into the ICDDR,B area. A new convex mirror has been fixed in CHP/hospital blind corner for traffic safety. Security guards for Matlab and Chittagong offices were contracted out; security coverage provided for visiting dignitaries, and delegations. Cleaning services in different areas are partially contracted out. New areas were developed for gardening. Fumigation and rodent control measures were taken. Over 60,000 international and local pieces of mail were handled during the year. Messenger services were provided for distribution of internal mail, and for mail to and from Matlab. Liaison with Government offices in disposal of unclaimed dead bodies of patients and other services were also rendered.

General Administration

Estate & Property

Senior Officer: Mujibur Rahman

The Estate and Property Office maintains the telecommunication systems of the Centre. We have 10+200 extension lines PABX and 80 direct telephone connections. Timely payment of Centre's utility bills, such as electric, gas, water, telephone, and telex and monthly rental bills of household appliances of the expatriate staff of the Centre are also issued by this office. It arranges for official lunches and receptions, and manages the accommodation of expatriate staff in the Guest House and elsewhere. In 1994, the Estate Office arranged seven new telephone connections including 2 ISD. The Xerox Unit of this office has mimeographed 780,000 copies and photocopied 240,000 copies for scientific divisions. The Estate Office has located and prepared lease agreements for nine new houses and renewed the lease contract of five existing houses. The Guest House of the Estate Office has accommodated about 230 guests. This includes official guests, training participants and some outside guests.

Travel Office

Manager, Travel Services: Kh. Shafiqul Hossain

The Travel Office is responsible for arranging Bangladesh visas for expatriate staff, consultants, trainees, visitors, and customs passbooks, air-tickets and foreign visas for staff, visitors and their families. This office attends to airport arrivals and departures of important visitors and staff. It also provides assistance for shipments of personal effects of expatriate staff.

During 1994, the Travel Office obtained 28 Bangladesh visas for new expatriate staff and their families, 47 Bangladesh visas were renewed, 3 new customs passbooks were obtained and 22 existing passbooks were revalidated; 1,690 travel authorizations raised; 105 foreign visas (UK, USA, Switzeriand, Sweden, China, France, Thailand, India, Pakistan) obtained; 277 persons received and seen off at Dhaka airport; and six shipments of personal effects handled.

The ICDDR,B Creche

Director: Rukhsana Haider

ICDDR,B was the first hospital in Bangladesh to

open a creche for its female employees. The creche was started in November 1993 to encourage and support the Centre's female staff to breast-feed their babies until 2 years of age. The creche is open from 6 a.m. to 10:00 p.m. and is run by a staff of three, previously trained in the hospital. Initially established by generous donations from many of the employees, the salaries of two staff are now supported by the ICDDR,B Staff Welfare Association and the third by the contributions of the mothers themselves. Ten to twelve babies are cared for in the creche at present. The ICDDR,B creche has received much commendation and is shown as a model to other organizations and hospitals which support breast-feeding and are keen to start their own.

Transport Management Branch
Transport Officer: Md. Hamidullah

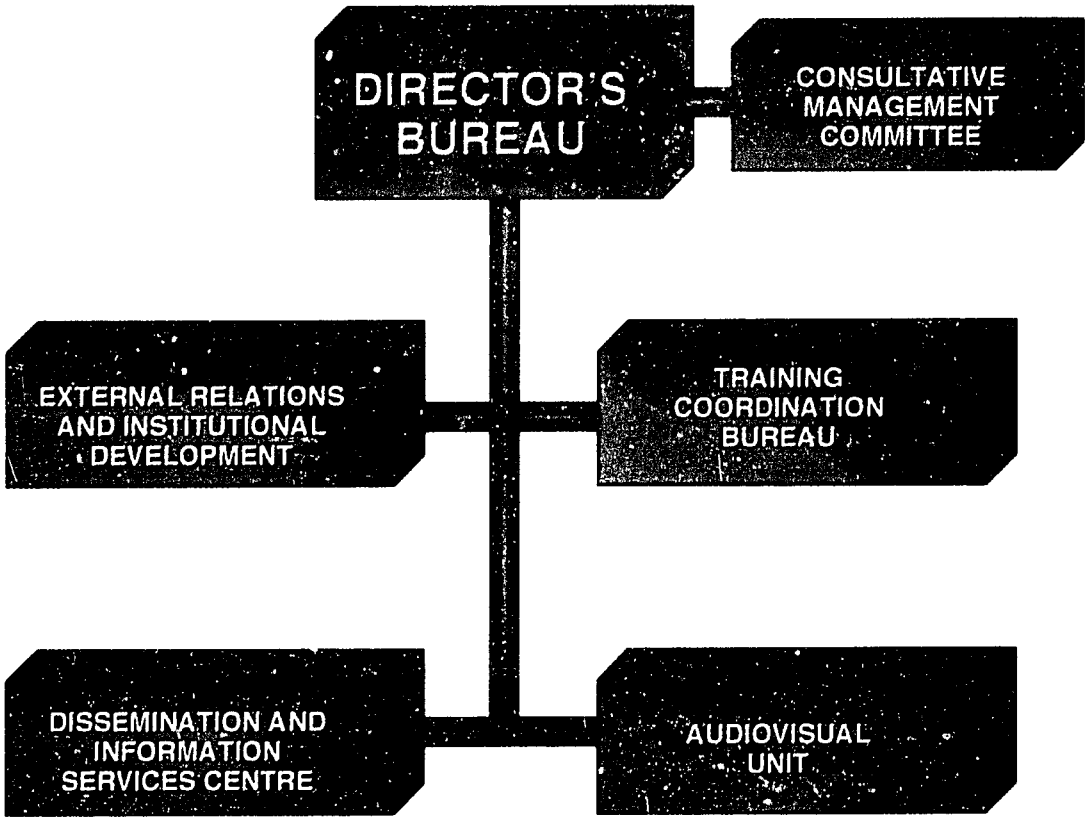
This branch gave logistic support to the Centre's activities by providing land and water transportation. The staff were supported with 69 vehicles (10 icluding 2 auto-rickshaws being hired). The Branch provided logistic support to all seminars, workshops, and meetings at the Centre; and operated radio communication system between the Centre's Dhaka office and the Matlab Health and Research Centre.

Five new vehicles were procured (one each for MCH-FP, BADC, Chakaria Project, Matlab H&RC and the Transport Pool). The Centre received the donation of an ambulance from the Korean Government.

Fakrul

The Creche makes the Centre a mother-friendly workplace

DIRECTOR'S BUREAU



DIRECTOR'S BUREAU

External Relations and Institutional Development Office

Assistant Director: Graham A.N. Wright

The External Relations and Institutional Development Office has been reorganized to encompass the functions of External Relations, Grants Administration, Committees Coordination, as well as Public Relations and Information office.

The year saw many important changes in personnel. Graham A.N. Wright, who has provided management consulting services to the Centre since 1988, was appointed Assistant Director, External Relations and Institutional Development. The Centre was fortunate to be able to recruit Dr. Ishtiaque Zaman to replace Mr. Arifuzzaman Khan who left for doctoral studies in Australia. Mr. Jim Bausch, the consultant leading the efforts to prepare for the Centre Fund drive in North America, resigned to become President of the National Charities Information Bureau. The Child Health Foundation agreed to become the coordinating organization for the US-based Centre Fund drive efforts. Mr. Robert Smith, former Vice-president of the University of Maryland Foundation, was persuaded to come out of retirement to lend his extensive experience and expertise, joining Charlene Dale as a consultant to ICDDR,B on the Centre Fund. Waimar Tun, the ICDDR,B Desk Officer at CHF, was recruited in September and Brent Berwager, the Centre's new US-based Senior Development Officer, started in January 1995.

The Resource Development Strategy (RDS), prepared in 1992, was further refined. The RDS has five major objectives:

> To increase the annual flow of funds by 10% or more through the broadening of its funding base.

> To maintain the current trend of long-term institutional or core funding under multi-year agreements.

> To secure Government of Bangladesh agreement for the use of bilateral funding for the provision of health care services.

> To establish the Centre Fund of $20 million (in two phases: 1996: $10 million, 2000: $20 million).

> To establish the Hospital Endowment Fund of $10 million (in two phases: 1996: $5 million, 2000: $10 million).

The Centre has largely achieved these objectives. The budget did not increase by 10% in 1994 largely due to delays in recruitment of international staff, but the funding commitments and the completion of this recruitment mean that the Centre will achieve the first objective of the RDS in 1995.

Core/institutional funding decreased by $154,000 (3.4%), and **project funding** increased by $453,000 (8.0%).

The success of the ongoing efforts to **broaden the funding base** of the Centre was demonstrated by funding received from the **European Union**, the **Swiss Red Cross**, the Government of **Thailand** and **CARE-Bangladesh**, and a commitment from **Sri Lanka**.

Additional contributions were received from several of the Centre's traditional donors: the governments of **Australia** and **Japan** which provided important new funds for family planning services and training in Matlab; the **Royal Netherland**s Government funded the Research Initiative on Safe Motherhood and Child Survival (RISC); a **NORAD** agreement will fund the activities of the Epidemic Control Preparedness Programme for the next three years; an **ODA** agreement to fund a study on Reproductive Tract Infections, and a three-year agreement signed with

Asem Ansari

Mr. Albert Mehr, Charge d'Affairs, Swiss Embassy (right), and Dr. Michael A. Strong of ICDDR,B sign the SDC Agreement 1995-97 which provides funds for the Centre's research and training activites and $ 3 million for the Hospital Endowment Fund

SDC provides funding for an extensive research programme concentrating on community-based approaches to improve health.

To strengthen scientists' capacity to generate their own extra-mural funds through **competitive grants**, in conjunction with the Budget Office, the ER&ID Office presented a seminar covering all aspects of resource development from project proposal writing to grants administration. The Office has also developed a library of resource materials to assist PIs prepare their own competitive grants project proposals for submission to NIH, foundations, corporations, and other non-traditional sources of funds.

Core/institutional funding was strengthened by new multi-year agreements with the **Government of Bangladesh** (which kindly agreed to further increase its contribution by 65% and to make this a regular annual contribution), **BADC** (which agreed to maintain its five seconded experts at the Centre, and to make a significant contribution to core for three more years), the **Royal Netherlands** Government (which agreed to start making core contributions for three years), and **SDC** (which agreed to provide substantial core funding for the next three years). However an unexpected reduction of the **CIDA** contribution was a setback.

Attempts to secure the **use of bilateral funds** to support health care and other services provided by the Centre received a boost at the Support Group meeting in November when the Secretary of Economic Relations Division (Ministry of Finance) announced that in the case of the Centre, the Government of Bangladesh had allowed, wherever necessary, the use of bilateral assistance for the development programmes of the Centre, and that this policy would continue.

The Assistant Director, ER&ID, spent July in the United States working with staff and consultants of the **Child Health Foundation** (CHF) to plan the **Ford Foundation**-funded **Centre Fund endowment campaign**, and make some initial contacts. Together, this team prepared the draft Case Statement that will constitute the major component of the Centre's North America campaign. The Case Statement is designed to describe the Centre and its work in a way that will appeal to lay people in North America. It is helping form consensus among those involved in the

Renate Mehr

Mr. Albert Mehr (left), Dr. Demissie Habte (middle), and Mr. Peter Arnold, SDC (right) celebrate "Swiss Week" and the US$ 15,000 it raised for the Hospital Endowment Fund

Centre and the campaign; was the basis for an encouraging feasibility study to examine the market for the Centre and its work; and continues to provide a tool with which to involve people in the campaign. The Director made several follow-up visits to the US to hold meetings with senior officials at the **Ford Foundation** and **Rockefeller Foundation**, **USAID** and other organizations interested in supporting the Centre Fund. At the November meeting, the Centre's Board of Trustees resolved to commit $230,000 to implement the planned activities of Centre Fund campaign in 1995.

The **Hospital Endowment Fund** campaign has been managed with energy and enthusiasm by Dr. Mahalanabis and Ms. Loretta Saldanha since its initiation in 1991, and it was very appropriate that before Dr. Mahalanabis left the Centre, the **SDC** contributed $3 million to the Fund. From January 1995, the campaign will be coordinated by the ER&ID Office. Planning for the next phase of the campaign is now underway.

The RDS also stressed the need to improve the Centre's communication and public relations capabilities, particularly outside Bangladesh. As part of this the ER&ID Office produced several new brochures: "ICDDR,B, A Centre for Health and Population Research"; "The Centre Fund" (for use in North America); "ICDDR,B" - in Japanese (for use in Japan); and "ICDDR,B - Population and Family Planning activities" (produced with the Population and Family Planning Division and distributed at the International Conference on Population and Development in Cairo). The Office worked with AVCom, a Bangladeshi video company, to produce two promotional videos, "ICDDR,B: the Centre for Health and Population Research" (giving a 13-minute overview of the Centre and its activities) and 'Matlab, the world's leading health and population field research site" which runs for 23 minutes.

The Office coordinated and facilitated the visits from Australian Broadcasting Corporation (TV and radio), British Broadcasting Corporation (TV and radio), and Star TV. These covered different aspects of the Centre's work focusing on either ORS or family planning activities. Other print media journalists from Bangladesh, Sweden, India, Japan and the USA were also given briefings/ materials.

The ER&ID Office also played a key role in the organization of the award-giving ceremony in **celebration of 25 Years of ORS**, together with all the accompanying promotional literature and the special edition of "Glimpse". Finally, on 5 February 1994, amid much pomp and glamour, ICDDR,B, in conjunction with the Ministry of Health and Family Welfare of the Government of Bangladesh, celebrated 25 Years of ORS. In a brief ceremony, awards were presented by the Prime Minister Begum Khaleda Zia to the Bangladesh Rural Advancement Committee (BRAC), the Government of Bangladesh, UNICEF, UNDP, USAID and WHO in recognition of their contributions to ORS and international health research.

As part of its institutional development activities, the ER&ID Office is also charged with the organization of the Centre's **planning**, and was responsible for the coordination of the finalization and production of the Strategic Plan: "To the Year 2000." The Plan was prepared in consultation with the Centre's scientists, Board of Trustees and Donors' Support Group; government, multi-lateral and non-governmental organizations and senior international scientists across the globe. It was completed in a series of retreats, workshops, and consultative meetings

AVCom video team focuses in on Basona-the star of the Centre's new video film on Matlab

An AVC[illegible]n photo

over the one-and-half years to June 1994 when it was formally adopted by the Board of Trustees.

The Office also coordinated the preparation of the Centre's Biennial Work Plans for 1995-96 and the internal accountability review to see planned vs. actual achievements for the period 1993-94. The latter provided interesting insights into the Centre's management and activities.

- Over 80% of the planned scientific activities had been completed or were on-going, and many additional activities undertaken.

- In half the cases where activities had not been implemented, funding problems were cited as the principal cause.

- Other barriers to implementation included:

  > The emergence of *V. cholerae* O139 which made several *V. cholerae* O1-related studies irrelevant and/or impractical to implement.

  > The Principal Investigator or collaborator leaving the Centre or institute abroad with whom the Centre was collaborating.

  > Clinical equipment (and the associated skills) not available.

Thirty-three additional large-scale scientific activities were undertaken in response to changing priorities and opportunities that arose, including multiple studies on *V.cholerae* O139; evaluation of low-osmolarity ORS; response to epidemic in the Rwandan refugee camp; extensive technical assistance and evaluation work in environmental health with the **Government of Bangladesh, UNICEF**, and **CARE**; work with National Steering Committees to strengthen MCH-FP services; extensive work on vitamin A including examining the feasibility of supplementation at EPI contacts; technical assistance in health and population planning and monitoring of the **Government of Bangladesh, USAID, UNICEF, World Bank**, and **WHO**; development and initial implementation of the Information Technology Strategy; initiation of HIV/AIDS work; completion of the baseline surveys and initial studies in collaborative ICDDR,B-BRAC project and initiation of the Chakaria Community Health Project.

To facilitate **grants administration** and PIs reporting to donors, a new reports monitoring system has been established to track when reports are due under the many agreements entered into by the Centre. Two months prior to a report falling due, the PI and his/her Division Director are warned; if the report becomes overdue, the Director is informed. In addition, this system alerts the TCO and the Budget Office whenever there are only 4 months to the expiry of the grant. This allows review to ensure that the grant is being spent in line with the agreement or if any action needs to be taken to extend or amend the grant agreement. The Office continued to provide training and guidance on donor regulations and the terms and conditions of grant agreements. It also coordinated the initiation of a new internal competitive grants programme for research funds provided by **USAID** and **SDC**.

The World Shall be Poorer

There is a certain natural reluctance, perhaps particularly noticeable in the scientifically-oriented communities, to venture into the market place and actively, even aggressively, seek financial funding. Indeed, it has been termed "begging" by some. We would, therefore, like to explain: fund-raising is a long-accepted activity, and indeed profession. Throughout the world, organizations (foundations, trusts, etc.) have been established explicitly to give money to worthy causes, and many philanthropic individuals are also looking for similar causes to support with their own funds. Today, worldwide (including here in Bangladesh) there are many such good causes, all employing increasingly sophisticated marketing techniques to persuade government agencies, foundations and individuals to give money to their "cause." If the Centre does not undertake an active and progressive programme of explaining its work and the importance of this work for the world, it will find itself without the funds with which to do that work. Then the Centre, and indeed the world, shall be poorer.

Contributions on a revenue earned basis from 1989 in US$

	1994	1993	1992	1991	1990	1989
Revenue Contributions	**10,468,238**	**10,170,494**	**9,527,010**	**10,348,920**	**8,921,663**	**11,797,755**
Asian Development Bank	32,851					
Arab Gulf Fund	250,000	250,000	350,000			
Australia - AIDAB	299,256	210,980	234,417	232,061	216,139	194,655
Bangladesh	187,500	113,849	26,251	26,170	27,695	29,838
Bayer AG	72,866	73,159	19,068	23,218	74,760	34,481
Belgium - BADC	341,182	279,998	324,348	409,904	288,992	324,536
Canada - CIDA	353,761	800,000	856,621	885,943	213,022	1,282,025
CARE	21,603	12,783				
China	20,000	20,000				
Denmark - DANIDA	88,658	186,671	239,095	205,896	169,641	437,383
Ford Foundation	270,347	302,022	148,669	51,715	113,227	147,524
Helen Keller International	9,475	27,204	4,055	8,646	4,690	
IDRC	90,000	88,825	64,174	70,174	51,731	27,707
Japan	683,691	367,009	454,817	434,807	387,000	314,918
Johns Hopkins University	64,503	22				
Netherlands	453,850		149,385	336,238	764,790	111,553
Norway - NORAD	122,004	133,961	97,000	310,562	326,641	321,755
Population Council		25,331	1,419			
Rockefeller Foundation	29,693	39,155	15,360			
Saudi Arabia	58,000	57,696	58,636	57,275		33
Sweden - SAREC	528,174	393,460	385,655	340,165	121,491	89,760
Switzerland - SDC	1,419,976	1,266,215	1,340,475	1,785,342	1,145,633	1,040,676
- Red Cross	147,821					
United Kingdom - ODA	488,022	417,395	291,706	277,534	397,434	253,410
United States - AID/NIH	3,549,801	3,518,971	3,422,666	3,004,837	3,251,195	4,978,285
UNDP		(7,300)	150,178	19,062		
UNDP/WHO	350,000	350,002	307,613	337,844	163,752	378,771
UNFPA	123,753	223,713	91,243			
UNICEF	305,554	301,314	324,308	325,829	252,538	256,383
University of California	22,926	21,865	555			
WHO	53,579	76,861	64,163	88,388	166,428	241,417
WUSC				801,673	741,914	742,318
Others	29,392	26,489	59,729	86,080	42,950	135,270
Disaster Relief		602,844	45,404	229,557		455,057
Capital Contributions		**400,000**	**1,435,480**	**330,568**	**48,788**	**272,159**
Bangladesh			1,135,480			
Sasakawa Foundation		400,000	300,000	300,000		
UNCDF				30,568	48,788	272,159

Contributions in 1994 from Others were received from European Union, Family Health International, International Atomic Energy Centre, Macro International, Sight and Life, Stichting Redt De Kinderen and Wander Ag

During 1994 contributions in kind were received from Bangladesh, Belgium, Child Health Foundation, Population Council and Republic of Korea

The Dissemination and Information Services Centre

Head: M. Shamsul Islam Khan

The Dissemination and Information Services Centre (DISC), formerly the Diarrhoeal Diseases Information Services Centre, has been playing a vital role in supporting the Centre's research, training, dissemination, and other activities through: development of a collection of information sources (books, journals, and others); offering library services, such as reading and borrowing facilities, inter-library loans, reference, photocopying, and literature search; publication of a quarterly international journal, an annotated bibliography (within the journal), three newsletters, two current awareness bulletins, an annual report, and occasional scientific and special publications; and offering editorial assistance to other divisions.

In 1994, DISC continued to extend its various facilities to the Centre's staff, including those in the field stations located in different places in the country. The facilities and some services were also used by persons other than the Centre's staff. Various programmes were undertaken by 11 staff members, and 1 part-time editor.

The Library Advisory Committee and the editorial boards for the journal and newsletters, made up of representatives from scientific divisions of the Centre, met several times to carry out the assigned jobs and to review policies and services for improvement.

DISC upgraded its desktop publishing facilities by adding one personal computer and one laser printer. The major activities in 1994 are highlighted below:

Library use and services

- More than 500 of the Centre's researchers, research support personnel, and trainees used different facilities and services of the library. There were another 5,280 reader-visits by researchers, teachers, physicians, and students from universities, NGOs, and medical institutions.

- 402 new books (151 purchased), 608 volumes of bound journals, 130 reprints, 5 databases on CD-ROM/diskettes, and 400 current journals (243 on subscription) were added to the library collection.

- The library, under the inter-library loan relationships, continued to extend the borrowing facilities to the Institute of Public Health, Aga Khan Community Health Programme, USAID, UNDP, UNICEF, Population Council, National Health Library and Documentation Centre, Bangladesh Institute of Development Studies, and Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine & Metabolic Disorders (BIRDEM).

- Over 1,025 books and journals were loaned to the Centre's staff, and 655 to national institutions.

- Photocopies of 54,510 pages were made and supplied. External library users also enjoyed the benefit of the photocopying service. Under the membership programme, the photocopying service was offered at a reduced rate to the library members. The Nuffield Library (British Medical Association) continued to provide excellent support by meeting photocopying requests speedily.

- The library staff responded to 2,640 reference (formal and informal) queries, checked various reference citations for the Centre's scientists and research support personnel, and prepared short bibliographies in response to specific requests from researchers.

- 195 searches (110 for outsiders) from MEDLINE, AIDS, POPLINE, and Current Contents (Life Sciences) databases were made and offered to the Centre's scientists and research support personnel and to researchers, students and teachers from other organizations.

Information dissemination

- 24 issues of the **DISC Bulletin** and 101 issues of the **Fast Bulletin** were produced to disseminate information on relevant articles, documents, books, journals, and meetings.

- The quarterly **Journal of Diarrhoeal Diseases Research** (600 copies per issue) published 45 articles in 4 issues, and received 54 articles from local and international contributors and disseminated information on 351 published papers on diarrhoeal diseases.

- The bimonthly English language newsletter **Glimpse** (5,000 copies per issue) highlighted important events and achievements of the Centre and disseminated the contemporary works of the Centre's scientists published in various local and international journals in 1994. One combined issue was particularly devoted to highlighting the "25 Years of ORS Celebration." Over 4,500 copies of each issue of the newsletter are distributed in 137 countries.

- Four issues of the quarterly Bangla newsletter **Shasthya Sanglap,** meaning "dialogue on health" (25,000 copies per issue), highlighted issues relating to primary health care for the benefit of the health workers at the grassroots level. Suggestions were sought from the readers to find out its usefulness and improve its contents. The responses so far received are highly encouraging. The newsletter is distributed to individuals and health workers concerned with primary health care issues, and to libraries and information centres in Bangladesh.

- The bilingual newsletter **ICDDR,B News** (500 copies in English and 500 copies in Bangla) continued to disseminate staff news, such as appointments, promotions, transfers, separations, extracurricular activities, and other related information to facilitate internal communication among the staff. It also spotlighted commendable achievements by members of the Centre's staff. In 1994, four issues were produced.

- A 462-page monograph entitled "Matlab: Women, Children and Health" (3,000 copies) was published. The monograph highlighted the studies done and the achievements made in Matlab. The sale proceeds of this book are forwarded to the Centre's Hospital Endowment Fund.

- The **1993 Annual Report**, three **scientific reports**, two **working papers**, and six **special publications** were published in 1994.

- Over 147,500 copies of the Centre's different publications and promotional materials were either mailed or distributed worldwide. The mailing database was revamped to make it more effective.

- The Centre's staff enjoyed the editorial service offered by the publication staff.

Collaboration: Under the collaborative relationships, duplicate copies of books and journals and different types of the Centre's publications were freely distributed to many national organizations. DISC offered short-term training facilities to Ms. Umme Kulsum Shewly and Ms. Dilruba Mahbuba, both students of the Library and Information Science Department of Dhaka University on modern library and information services. Ms. Shahanara Islam, a graduate student of journalism and mass communication in Dhaka University also received short-term hands-on training on printing and publication. At the request of IDRC, Singapore Office, DISC organized a one-day workshop on electronic networking in Asia ("Asian Telecommunity") in May 1994 at the Sasakawa

International Auditorium at ICDDR,B. About 28 participants from different organizations (government, autonomous, and NGOs) with whom IDRC has contacts attended the workshop.

The Centre signed an agreement to participate in a consortium of 8 organizations (AHEAD--Asian Health, Environmental & Allied Databases) to make available their databases and publications in CD-ROM format. The first CDs of this consortium will be available in the market sometime in mid-1995. The JDDR (including the bibliography) will also be available in the CD-ROM format for wider dissemination.

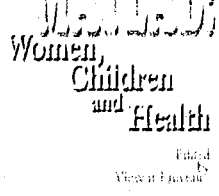
Earning of revenues: The 1994 cost report shows that DISC earned an amount of US$17,800 through sale of the Centre's publications, journal subscriptions, membership fees, retrieval service, and photocopying service.

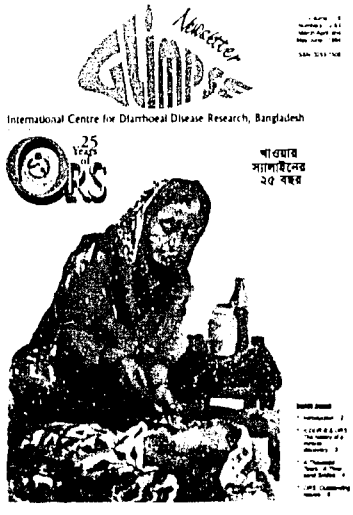
Foreign visit: In January, Head of DISC, visited India to attend the 39th All India Library Conference and the Diamond Jubilee Celebration of ILA held in Bangalore. He also attended the first Board of Directors meeting of the consortium on CD-ROM of Asian Health, Environment & Allied Databases (AHEAD), held in Singapore in August.

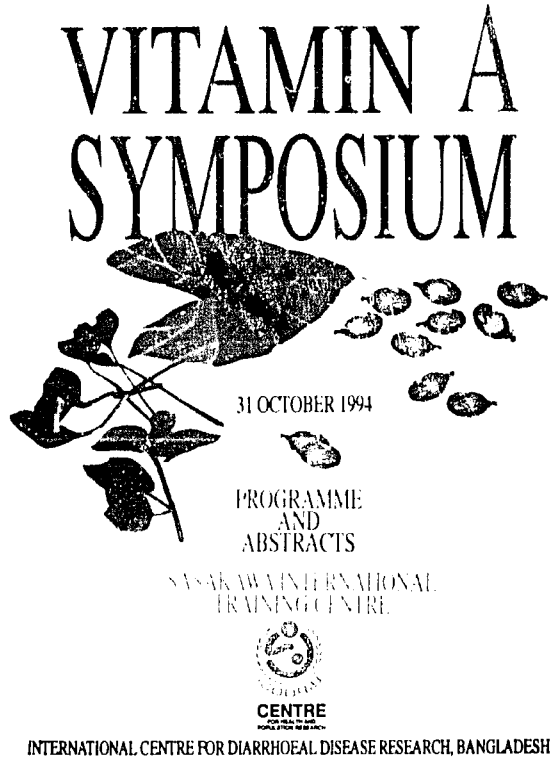
Audiovisual Unit

Head: Asem Ansari

The Unit is responsible for preparing illustrations that are used in different publications; lay-out of publications, posters, brochures, and other display materials; taking and developing photographs; producing slides; and audio and video recording. In 1994, the Unit was specially equipped with a colour scanner, polaroid digital slide maker (C1 5000S) to produce high-quality products.







ICDDR,B Publications 1994

A I..ernal Publication Series

A1 ICDDR,B Annual Report 1993. May 1994. 105 p.

Scientific Reports

A2 Demographic Surveillance System-Matlab. V. 20. Registration of demographic events-1989. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1993. 71 p. (ICDDR,B Scientific Report, 72)*

A3 Demographic Surveillance System-Matlab. V. 21. Registration of demographic events-1990. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1994. 71 p. (ICDDR,B Scientific Report, 73)

A4 Demographic Surveillance System-Matlab. V. 22. Registration of demographic events-1991. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1994. 71 p. (ICDDR,B Scientific Report, 74)

Special Publications

A5 Aziz KMA, Sack J, editors. "Environmental health and policy perspectives"; programme and abstracts of the Third Annual Scientific Conference of the International Centre for Diarrhoeal Disease Research, Bangladesh, Dhaka, 15-16 January 1994. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1994. xiv, 51 p. (ICDDR,B Special Publication, 32)

A6 International Centre for Diarrhoeal Disease Research, Bangladesh. Strategic Plan: "To the Year 2000." Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1994. 40 p.

A7 Fauveau V, editor. Matlab: women, children and health. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1994. 462 p. (ICDDR,B Special Publication, 35)

A8 Hoque BA, Khan MSI, editors. Report on the Third Annual Scientific Conference (ASCON-III), Dhaka, 15-16 January 1994. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1994. 36 p. (ICDDR,B Special Publication, 34)

A9 Proceedings of the Support Group Meeting of the International Centre for Diarrhoeal Disease Research, Bangladesh, Dhaka, 22 November 1993. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1994. 41 p. (ICDDR,B Special Publication, 33)

A10 Vitamin A Symposium; programme and abstracts, Dhaka, 31 October 1994. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1994. 21 p. (ICDDR,B Special Publication, 36)

Working Papers

A11 Baqui AH, Jamil K, Jahangir NM, Nahar Q, Paljor N, Silimperi DR. Urban surveillance system-Dhaka: methods and procedure. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1994. vi, 38 p. (Urban MCH-FP Working Paper, 2; ICDDR,B Working Paper, 45)

A12 Paljor N, Baqui AH, Lerman C, Silimperi DR. Reaching the urban poor - the case of the urban volunteers in Dhaka, Bangladesh. Dhaka: International Centre for Diarrhoeal Disease Research, Bangladesh, 1994. viii, 21 p. (Urban FP/MCH Working Paper, 1; ICDDR,B Working Paper, 44)

Journal and Newsletters

A13 Journal of Diarrhoeal Diseases Research (also includes: Bibliography on Diarrhoeal Diseases). V. 11, no. 4, 1993*; V. 12, nos. 1-3, 1994.

A14 Glimpse. V. 15, no. 6, 1993*; V. 16, nos. 1-5, 1994.

*Not listed in earlier annual reports.

A15 Shasthya Sangla. V. 2, no. 4, 1993; V. 3, nos. 1-3, 1994.

A16 DISC Bulletin. V. 18, nos. 1-24, 1994.

A17 ICDDR,B News. V. 4, no. 4, 1993; V. 5, nos. 1-3, 1994.

B Original Scientific Papers (Including Short Reports)

B1 Ahmed F, Clemens JD, Rao MR, Banik AK. Family latrines and paediatric shigellosis in rural Bangladesh: benefit or risk? Int J Epidemiol 1994 Aug;23(4):856-62

B2 Ahmed ZU, Hoque MM, Rahman ASMH, Sack RB. Thermal stability of an oral killed-cholera-whole-cell vaccine containing recombinant B-subunit of cholera toxin. Microbiol Immunol 1994;38(11):837-42

B3 Alam AN, Islam MR, Hossain MS, Mahalanabis D, Hye HKMA. Comparison of pivmecillinam and nalidixic acid in the treatment of acute shigellosis in children. Scand J Gastroenterol 1994 Apr;29(4):313-7

B4 Alam AN, Sarker SA, Wahed MA, Khatun M, Rahaman MM. Enteric protein loss and intestinal permeability changes in children during acute shigellosis and after recovery: effect of zinc supplementation. Gut 1994 Dec;35(12):1707-11

B5 Albert MJ, Kabir I, Azim T, Hossain A, Ansaruzzaman M, Unicomb L. Diarrhea associated with *Cyclospora* sp. in Bangladesh [case report]. Diag Microbiol Infect Dis 1994 May;19(1):47-9

B6 Albert MJ, Holme T, Lindberg B, Lindberg J, Mosihuzzaman M, Qadri F, Rahman MM. Structural studies of the *Shigella boydii* type 5 O-antigen polysaccharide. Carbohydr Res 1994;265:121-7

B7 Alim ARMA, Faruque SM, Ahmad QS, Hossain KMB, Mahalanabis D, Albert MJ. Evaluation of a non-radioactive chemiluminescent method for using oligonucleotide and polynucleotide probes to identify enterotoxigenic *Escherichia coli*. J Diarrhoeal Dis Res 1994 Jun;12(2): 113-6

B8 Bairagi R, Chowdhury MK. Socioeconomic and anthropometric status, and mortality of young children in rural Bangladesh. Int J Epidemiol 1994;23(6):1179-84

B9 Balk D. Individual and community aspects of women's status and fertility in rural Bangladesh. Pop Stud 1994 Mar;48(1):21-45

B10 Baqui AH, Arifeen SE, Amin S, Black RE. Levels and correlates of maternal nutritional status in urban Bangladesh. Eur J Clin Nutr 1994 May;48(5):349-57

B11 Bardhan PK, Rahman ASMH, Islam S, Rahman M, Gyr K. Octreotide (SMS 201-995) as an antisecretory agent in cholera toxin & bile acid induced intestinal secretion in an *in vivo* animal study. Indian J Med Res 1994 Oct;100:184-9

B12 Becker S, Begum S. Reliability study of reporting of days since last sexual intercourse in Matlab, Bangladesh. J Biosoc Sci 1994 Jul;26(3):291-9

B13 Becker S. Understanding seasonality in Bangladesh. Ann NY Acad Sci 1994 Feb 18;709:370-8

B14 Chowdhury MK. Mother's education and effect of son preference on fertility in Matlab, Bangladesh. Pop Res Pol Rev 1994;13:257-73

B15 de Francisco A, Fauveau V, Sarder AM, Chowdhury HR, Chakraborty J, Yunus M. Measles in rural Bangladesh: issues of validation and age distribution. Int J Epidemiol 1994 Apr;23(2):393-9

B16 Faruque ASG, Mahalanabis D, Islam A, Hoque SS. Severity of cholera during concurrent infections with other enteric pathogens. J Diarrhoeal Dis Res 1994 Sep;12(3):214-8

B17 Faruque ASG, Mahalanabis D, Albert MJ, Hoque SS. Studies of infection with *Vibrio*

cholerae O139 synonym Bengal in family contacts of index cases [short report]. Trans R Soc Trop Med Hyg 1994 Jul-Aug;88(4):439

B18 Faruque SM, Comstock L, Kaper JB, Albert MJ. Distribution of *Zonula occludens* toxins (*zot*) gene among clinical isolates of *Vibrio cholerae* O1 from Bangladesh and Africa [short report]. J Diarrhoeal Dis Res 1994 Sep;12(3):222-4

B19 Faruque SM, Alim ARMA, Roy SK, Khan F, Nair GB, Sack RB, Albert MJ. Molecular analysis of rRNA and cholera toxin genes carried by the new epidemic strain of toxigenic *Vibrio cholerae* O139 synonym Bengal [note]. J Clin Microbiol 1994 Apr;32(4):1050-3

B20 Filteau SM, Sullivan KR, Anwar US, Anwar ZR, Tomkins AM. Iodine deficiency alone cannot account for goitre prevalence among pregnant women in Modhupur, Bangladesh. Eur J Clin Nutr 1994 Apr;48(4):293-302

B21 Gonzalez-Ruiz A, Haque R, Rehman T, Aguirre A, Hall A, Guhl F, Warhurst DC, Miles MA. Diagnosis of amebic dysentery by detection of *Entamoeba histolytica* fecal antigen by an invasive strain-specific, monoclonal antibody-based enzyme-linked immunosorbent assay. J Clin Microbiol 1994 Apr;32(4):964-70

B22 Haider R, Khan AKA, Roy SK, Dewan N, Alam AN, Mahalanabis D. Management of acute diarrhoea in diabetic patients using oral rehydration solutions containing glucose, rice, or glycine. Br Med J 1994 Mar 5;308(6929):624-6

B23 Hall A, Nahar Q. Albendazole and infections with *Ascaris lumbricoides* and *Trichuris trichiura* in children in Bangladesh. Trans R Soc Trop Med Hyg 1994 Jan-Feb;88(1):110-2

B24 Hall A, Conway DJ, Anwar KS, Rahman ML. *Strongyloides stercoralis* in an urban slum community in Bangladesh: factors independently associated with infection. Trans R Soc Trop Med Hyg 1994 Sep-Oct;88(5): 527-30

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B26 Haque R, Neville LM, Wood S, Petri WA, Jr. Detection of *Entamoeba histolytica* and *E. dispar* directly in stool [short report]. Am J Trop Med Hyg 1994 May;50(5):595-6

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B28 Hoque BA, Hoque MM. Partnership in rural water supply and sanitation: a case study from Bangladesh. Health Pol Plann 1994;9(3): 288-93

B29 Hoque BA, Hoque MM, Ali N, Coghlan, SE. Sanitation in a poor settlement in Bangladesh: a challenge for the 1990s. Environ Urban 1994 Oct;6(2):79-85

B30 Hoque BA, Aziz KMA, Hasan KZ, Sack RB. Women's involvement in a rural Bangladesh water and sanitation project. Southeast Asian J Trop Med Public Health 1994 Mar;25(1): 67-73

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B33 Hossain MA, Kibriya AKMG, Alam K, Jalal S. Isolation of salmonellae from stool of diarrhoeal patients in Bangladesh. Bangladesh J Microbiol 1994 Jun;11(1):1-7

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B36 Ibrahim AP, Conway DJ, Hall A, Bundy DAP. Enzyme polymorphisms in *Ascaris lumbricoides* in Bangladesh. Trans R Soc Trop Med Hyg 1994 Sep-Oct;88(5):600-3

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B39 Islam MA, Biswas E, Rahman AKSM, Chakma DB. Factors associated with safe preparation and home use of sugar-salt solution. Public Health 1994 Jan;108(1):55-9

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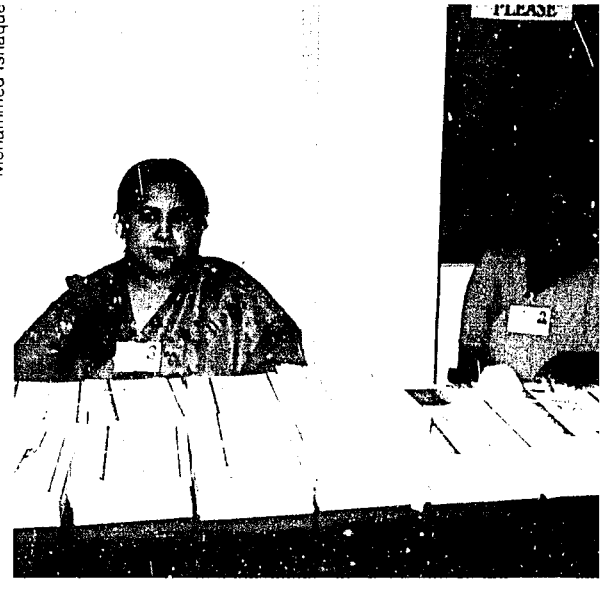
Mohammed Ishaque



Publications of the Urban Health Extension Project on display during a workshop at the Centre

Training Coordination Bureau

Head: A.N. Alam

ICDDR,B provides facilities for training of Bangladeshi and other nationals in areas of its competence. This training activity is a strategy to disseminate the knowledge and information gained by the Centre to health practitioners and researchers throughout the world. It is also a contribution toward research capacity building/strengthening in the developing countries.

The Training Coordination Bureau (TCB) conducted a wide variety of training courses, workshops, and seminars and offered fellowships during 1994. A total of 436 scientists, physicians, health administrators, health personnel and trainers from 20 countries received training at the Centre.

Health Research Training

The overall focus of the training programme continued to be on health research training. The Centre organized training courses and workshops, and offered fellowships. A total of 82 persons from 6 countries participated in this programme.

Health Research Training Fellowships: Four fellows (one each from Ethiopia, India, Nigeria, and the Philippines) received training. The duration of the fellowship was 1-2 years depending on the requirements of the research project undertaken by the individual fellow.

The Programme aims at developing research skills, particularly for "essential national health research." The Programme also strengthens linkages between ICDDR,B and health and research institutions in developing countries. It is based primarily on practical hands-on experience and involves the fellows from identifying the research topic through conducting the research and publishing the results.

The Research Methodology Workshop: A 2-week workshop was attended by 12 participants, including 5 staff/fellows of the Centre and 7 others (4 from Bangladesh and 1 each from Ethiopia, India, and Pakistan). The workshop enabled the participants to acquire quantitative skills, to develop and implement clinical research proposals, and to analyze and interpret data.

Courses on Epidemiological Methods in Public Health: Three 4-week courses were organized in collaboration with national institutions and NGOs, and were attended by 53 participants from various national institutions of Bangladesh. The course aimed at training the participants on how to plan, design, and undertake epidemiological studies, to apply appropriate methods in data collection, to analyze and interpret data, and to formulate, implement, and evaluate health interventions. Nine such courses have been offered since 1991, attended by 155 participants.

Research Traineeship: To provide opportunity to young Bangladeshi graduates to develop skills in health research, ICDDR,B has instituted a programme for providing practical training through its ongoing research protocols. Fellows in this programme are graduates in medicine, social sciences, and nutrition; some are also paramedics. The duration of training for these fellows is 1-2 years. Thirteen persons received training during the year.

Clinical Fellowship Programme

ICDDR,B offered fellowships (training on individual basis) to 54 persons from Bangladesh, Nepal, Bhutan, India, Pakistan, Sri Lanka, Maldives, Iraq, the Netherlands, the UK and the USA for training in research and other aspects of diarrhoeal diseases. The main objective of this programme is to provide fellows with clinical skills in diagnosing and treating patients with diarrhoea and malnutrition, and to provide insight into research methods. The different fellowship programmes are described below:

The Government Fellowship: The Government fellowship programme began in 1989 at the initiative of the Programme Coordination Committee of the Centre. On request from ICDDR,B, the Director-General of Health Services,

Fakrul

Growing number of nurses enrol in courses which give them the knowledge and skills to manage diarrhoeal diseases

Government of Bangladesh, nominated 8 fellows, one from each medical college. These fellows were provided intensive training on the clinical management of diarrhoeal diseases with an orientation in clinical pathology. On completion, these individuals were placed in various health facilities to be in charge of diarrhoea management. Since 1989, forty-five fellows have received training under this programme. An evaluation of the programme is underway to assess its effectiveness in terms of post-training utilization of the knowledge and skills.

The Fellowship for Nurses: Aiming at creating trained nurses for management of diarrhoeal patients in the country, the Centre offered 10 fellowships on a competitive basis. The objective of the programme is to provide nurses with adequate hands-on training to enable them to assist in managing diarrhoea patients and the diarrhoea treatment units.

The Fellowship for SAARC Countries: In 1994, the Centre continued to offer fellowships to the countries of South Asian Association for Regional Cooperation (SAARC). Nine fellows, 2 each from Pakistan and Bangladesh, and 1 each from Maldives, Nepal, Bhutan, Sri Lanka, and India, were provided with theoretical and practical training in current practices in treating diarrhoeal diseases, epidemiology, and prevention of diarrhoea.

Other Fellowships: Twenty fellows from UK, USA, Bangladesh, Iraq, and the Netherlands, received elective training on different aspects of diarrhoeal diseases. They worked in the hospital at the bed-side for hands-on training in clinical management of diarrhoeal disease and assisted the PIs with the current research protocols.

Postgraduate Students: In the Centre's laboratories, 6 M.Sc. and 1 M.Phil students of Dhaka University carried out research work for their dissertations.

International

Clinical Management of Diarrhoeal Diseases with Special Emphasis on Persistent Diarrhoea

Fourteen physicians, nurses, and diarrhoeal disease control programme managers (four from Vietnam, two each from Bangladesh, China, and Laos, one each from Nepal, Pakistan, Sudan, and Tanzania) attended this two-week course. The course was designed to provide participants with the skills necessary to diagnose and treat diarrhoea with different aetiologies and their complications. In addition, the participants were taught to organize courses for health personnel in their own countries. Tuition fees, travel, and living expenses were provided by grants from Japan and from UNICEF, Vietnam.

Laboratory Diagnosis of Common Diarrhoeal Disease Agents

A two-week course was attended by 10

participants: three from Bangladesh, two from Pakistan, and one each from Ethiopia, Indonesia, Kenya, Nepal, and Thailand. The course provided the participants with an opportunity to learn the principles of laboratory procedures for isolation and identification of pathogens responsible for diarrhoea and preparation of culture media. Laboratory safety was also emphasized.

Symposium on Vitamin A

A one-day symposium, supported by USAID and Task Force SIGHT & LIFE, Basel, Switzerland, was convened to disseminate the results of studies undertaken by the Centre and its collaborating institutions. A total of 113 national and international experts engaged in vitamin A research participated in the symposium inaugurated by Mr. Richard M. Brown, Mission Director of USAID in Bangladesh. The course consisted of three scientific sessions:
(1) assessment of vitamin A status: methodological issues; (2) dietary approaches to improve vitamin A status; and (3) effect of large doses of vitamin A on health during infancy and childhood. The sessions were chaired by: Dr. Barbara A. Underwood, Special Advisor on Vitamin A Programme, Nutrition Unit, WHO; Dr. Frances R. Davidson, Office of Health and Nutrition, USAID; and Dr. Donald S. McLaren, Retired Professor of Preventive Ophthalmology, Institute of Ophthalmology, University of London.

Short-term Courses: During the year, a series of one and two-day courses were organized for 272 students and health professionals from Bangladesh medical colleges and other government and non-government institutions on the management of diarrhoea with ORS.

Seminars: To provide opportunities for an exchange of information and views, 41 seminars were organized during the year in addition to 38 inter-divisional scientific fora and 15 clinical seminars at the Clinical Research and Service Centre. Both resident and visiting scientists presented seminars on varied topics, such as Mucosal Integrity and Inflammation in the Gastrointestinal Tract, Primary Hepatocellular Carcinoma and Viral Hepatitis, B & C Infection in Bangladeshi Subjects, and Quality Assurance in Primary Health Care.

Others: A group of four health personnel (one physician, one CDD programme manager and two laboratory technicians) from the Ministry of Health, His Majesty's Government of Bhutan received training at the Centre in their field of interest. The objective of their training was to strengthen the CDD Programme of the country. Their tuition fees and living expenses were provided by UNICEF, Bhutan.

Fakrul

The symposium on vitamin A brought to the Centre national and international experts in this discipline

Inter-divisional Scientific Forum List

Clinical Sciences Division

Choloyl paba: a simple test for diagnosis of bacterial overgrowth in the small intestine-P.K. Bardhan

Cefixime in the treatment of shigellosis-M.A. Salam

Use of rice-ORS in CRSC, ICDDR,B and its cost-effectiveness-A. Islam

HIV infection in infants and children: diagnosis and clinical presentation-K. Moffett

Dietary fibre and intestinal function: a study in volunteers-N.H. Alam

Use of conjunctival impression cytology as an indicator of vitamin A deficiency in young children -M. Rahman

Randomized, double-blind clinical trial of single dose ciprofloxacin vs single-dose doxycycline in the treatment of *V. cholerae* O139-W.A. Khan

Can breast-feeding counselling help mothers of partially breast-fed infants to breast-feed exclusively? -R. Haider

Management of childhood diarrhoea in a rural area of Bangladesh: the role of mothers and village practitioners-M. Ali

Community Health Division

Family planning in traditional markets in Nigeria: an example of health systems research (operations research)-E. Weiss

Health care costs for slum residents in Dhaka city, Bangladesh-M. Desmet

Effects of diarrhoea on growth of children under 5 years of age in rural Bangladesh-D.S. Alam

Safety of 25,000 IU vitamin A supplementation in infancy using EPI contacts-A.H. Baqui

Hospital care in a community-based programme for women of reproductive age in a rural area of Bangladesh-S.A. Khan

ALRI mortality - a case-control study in West Africa-A. De Francisco

Maternal immunization with polysaccharide pneumococcal vaccines-N.S. Shahid

Socioeconomic development and human well-being: exploring pathways of change-A. Bhuiya

Laboratory Sciences Division

Immunity in shigellosis-T. Azim

Use of polymerase chain reaction (PCR) to detect quinolone-resistant mutation in *gyrA* gene of *Shigella dysenteriae* type 1-M. Rahman

Vitamin A status of Bangladeshi children: which biochemical assessment method is appropriate?-M.A. Wahed

Colonization and protective potential of live *Vibrio cholerae* candidate vaccines in rabbit RITARD model-Z.U. Ahmed

Magnetic separation in diagnosis of infectious diseases-O. Olsvik

Impact of infection at birth with rotavirus on subsequent rotavirus infection: a preliminary analysis -L. Unicomb and N. Shahid

Monoclonal antibodies for the detection of *Vibrio cholerae* O139 Bengal-F. Qadri

Biochemical and cellular characteristics of myosin II of *Entamoeba histolytica*-Z. Rahim

Investigation of survival potential of *Shigella dysenteriae* type 1 in animate and inanimate objects using PCR and FA techniques-M.S. Islam

Immunoassays for diagnosis of pathogenic and non-pathogenic *E. histolytica*-R. Haque

Population and Family Planning Division

Child mortality differentials under maternal and child health and family planning programme in Matlab, Bangladesh-L. Nahar

Performance improvement through local planning: findings from an action research project-Y. Hassan

Workers' perception on MCH-FP Extension Project interventions and quality of care: some preliminary findings-R. Mita

The impact of field worker visits on contraceptive discontinuation in two rural areas of Bangladesh-M.B. Hossain

Disease patterns, treatment practices, and drug requirements in government rural MCH-FP facilities-H. Wirzba and T. Juncker

Contraception following child birth in Bangladesh-S. Salway

Vitamin A supplementation in the first 6 months of life: does it reduce diarrhoea and ARI morbidity?-S.E. Arifeen

Reflections on the Cairo Conference-D. Habte, R. Bairagi and Barkat-e-Khuda

Women's nutritional status and mortality - a proposed historical cohort study-V. Hosegood

DSS early indicators: Matlab 1993-M.A. Strong

Staff Development

Manager: B.R. Saha

The Centre continued its human resources development programme to sustain the ongoing research, training, and service activities and to meet the career ambitions of the staff. The objectives of the programme include: development and updating of skills, acquisition of new skills, and career development of staff. Ninety-one staff benefited from the programme in 1994. ICDDR,B received direct financial support from the Swiss Development Cooperation for the programme. In addition, scholarship support was secured from a number of agencies.

Overseas Training

At the beginning of the year, 23 staff were on training in various universities. During the year, an additional 14 left to begin studies, and 16 returned. Fourteen members of the staff made presentations at scientific conferences and workshops outside Bangladesh.

Brief descriptions on some of those who have returned after completion of training or left to begin are given below:

Dr. Abdur Razzaque, Senior Statistical Officer, Population Studies Centre, PFPD, earned Ph.D. degree in Demography from the Australian National University.

Dr. Md. Shahidullah, Statistician-Demography, Rural MCH-FP Extension Project, PFPD, earned Ph.D. degree in Demography from the Australian National University.

Dr. Dewan Shamsul Alam, Medical Officer, Matlab Health & Research Centre, CHD, earned a degree of Master of Medical Science (Nutrition) from the University of Queensland, Australia.

Dr. Mohammad Ali, Medical Officer, CSD, earned Master's degree in Medical Science Primary Health Care from the University of Western Australia.

Mr. Md. Nizam Uddin Khan, Research Officer, Population Studies Centre, PFPD, earned M.A. degree in Demography from the University of Pennsylvania, USA.

Mr. Mahidol Islam, Field Research Manager, Rural MCH-FP Extension Project, PFPD, earned MPH degree from the School of Public Health, Boston University, USA.

Dr. Selina Amin, Research Investigator, Urban MCH-FP Extension Project, PFPD, earned M.Sc. degree in Community Health in Developing Countries from the London School of Hygiene & Tropical Medicine, UK.

Mr. Md. Kapil Ahmed, Data Management Officer, Demographic Surveillance System, PFPD, earned Master's degree in Population Studies from the International Institute for Population Sciences, Bombay, India.

Dr. Amal K. Mitra, Associate Scientist, CSD, who has acquired MPH degree and completed the course work for the DPH degree at the University of Alabama in Birmingham, USA, has returned to the Centre to conduct his dissertation research work. He obtained the Dean's Award and honorary membership of the Delta Society for his academic excellence (GPA 4).

Dr. Syed Akramuzzaman, Associate Scientist, CSD, who has enrolled at the London School of Hygiene & Tropical Medicine, UK, for doctoral studies, has begun his doctoral research.

Ms. Parveen Akhter Khan, Operations Researcher, Rural MCH-FP Extension Project, PFPD, attended a course on "Anthropology of Health and Health Care" at the Mahidol University, Thailand.

Ms. Nahid Sultana, Senior Personnel Officer, Personnel Office, Administration & Personnel Division, attended a "Basic Management Programme" at the Asian Institute of Management (AIM), Philippines.

Mr. S.M. Iqbal, Computer Engineer, Computer Information Services, PFPD, attended a course on "Data Communications and Computer Networking" at the Asian Institute of Technology, Thailand.

Mr. Fakruzzaman, Programmer, Urban MCH-FP Extension Project, PFPD, attended a course on "Data Communications and Computer Networking" at the Asian Institute of Technology, Thailand.

Ms. Ferdous Jahan, Research Officer, Nutrition & Biochemistry, LSD, received training on "Nutrients

in Biological Fluids and Human Diets" at the University of Kerala, India.

Dr. Rubina Shaheen, Senior Medical Officer, Matlab MCH-FP Project, Matlab Health & Research Centre, CHD, left to begin studies at the University of Western Australia for Master of Medical Science degree in Community Nutrition.

Ms. Fazilantun Nessa, Research Fellow, Rural MCH-FP Extension Project, PFPD, began studies at the University of Exeter, UK, for an M.Phil. degree in Applied Population Research.

Dr. M. Mujibur Rahman, Senior Medical Officer, CR&SC, CSD, began studies at the University of Alabama at Birmingham, USA, for an MPH degree.

Mr. Nikhil C. Roy, Research Fellow, Rural MCH-FP Extension Project, PFPD, left to begin studies in Medical Demography at the London School of Hygiene & Tropical Medicine, UK.

Mr. Nurul Alam, Research Fellow, Population Studies Centre, PFPD, left to begin studies in Medical Demography at the London School of Hygiene & Tropical Medicine, UK.

Dr. Syed Samiul Hoque, Senior Medical Officer, CSD, began studies at the Medical Science Programme at the University of Birmingham, UK.

Evaluation of Training

During the year, an evaluation was undertaken to assess the impact of the Staff Development Programme during 1991-1993 in terms of: (a) use of the knowledge and skills acquired by the staff, (b) impact of the training on the performance of the staff, and (c) contributions of trained staff toward attainment of the Centre's goals.

The evaluation indicates that most staff sent for training returned to the Centre, and the majority of the staff who participated in the evaluation have been using the knowledge and skills in their present jobs, thereby contributing toward the achievement of the Centre's goals.

A good number of staff received promotion in recognition of their superior performance. Therefore, it appears that the Programme has helped the Centre in building a group of Bangladeshi scientists capable of constituting a critical mass of able researchers and support staff as a base for the long-term success of the institution. The evaluation also indicates that since the Programme had limited financial resources and depended mostly on external fellowships or scholarships (which often stipulated the field of training), the Centre could not often match the real staff training needs.

In-country Training

During the year, 22 staff were sent to several institutions within the country for training in financial management, the English language, communication, computer science, motivation and counselling, and transport management.

Mr. A.M. Sarder, Manager, Demographic Surveillance System, Matlab Health & Research Centre, PFPD, received an MPH degree (Health Education) from the University of Dhaka.

In-house Training

Within ICDDR,B, 41 staff attended training courses; 30 staff, mostly from the CHD, attended the courses on Statistical Package for Social Scientists (SPSS) and SAS, PC-based computer software for analyses of data; five staff attended Research Methodology Workshop organized by the Training Coordination Bureau (TCB) in collaboration with the Clinical Sciences Division; and six staff attended the course on Epidemiological Methods in Public Health.

Future Plans

During 1995 and beyond, the Centre's human resource needs will be determined by the Centre's Strategic Plan, while recognizing that the excellence of the potential trainee should be another determinant for selection of staff for training. To implement this policy, each division will undertake a study to assess the training needs of the division for 1995 and beyond.

COMMITTEES 1994

The Board of Trustees provides general direction to the affairs of the Centre. The Board has 17 members: the Director of the Centre, three persons nominated by the Government of Bangladesh, one by the World Health Organization (WHO), one by the United Nations Children's Fund (UNICEF), and 11 members at large, of whom at least half must come from developing countries. Each June, one-third of the members complete their three-year term unless re-elected for another, after which they must retire.

The Board meets twice a year, in June and November, in Dhaka, and considers matters of science, finance, and management. Highlights of the meetings are reported in the Centre's newsletter Glimpse. The Director of the Centre is Secretary to the Board. The 1994 members were:

Dr. Maureen Law (Canada), Chairperson
Dr. Demissie Habte (Ethiopia), Secretary
Mr. Syed Ahmed (Bangladesh) from November replacing Mr. S.S. Ahsan
Mr. S.S. Ahsan (Bangladesh) until November
Dr. Y.Y. Al-Mazrou (Saudi Arabia)
Prof. John C. Caldwell (Australia)
Prof. Chen Chunming (China)
Maj. Gen. (Retd.) M.R. Choudhury (Bangladesh) from June replacing Prof. Dr. K.M. Fariduddin
Prof. Dr. K.M. Fariduddin (Bangladesh) until February
Dr. Julio J. Frenk (Mexico)
Prof. K. Gyr (Switzerland) from June replacing Prof. A.S. Muller
Prof. J.R. Hamilton (Canada)
Dr. Ralph H. Henderson (WHO Representative)
Prof. Fehmida Jalil (Pakistan)
Mr. Md. Lutfullahil Majid (Bangladesh)
Prof. P. Helena Makela (Finland)
Prof. Fred S. Mhalu (Tanzania)
Prof. A.S. Muller (The Netherlands) until June
Dr. Jon E. Rohde (UNICEF Representative)
Prof. Y. Takeda (Japan) from June replacing Prof. Takashi Wagatsuma
Prof. Takashi Wagatsuma (Japan) until June

The Programme Coordination Committee (PCC) is a Committee established by the Board. Its prime objective is coordination of research with national health institutions. The PCC also strives to strengthen research capabilities and promote collaborative research with these institutions.

The PCC has 53 members: five from ICDDR,B, three nominated by the Board of Trustees, three nominated by the Ministry of Health and Family Welfare, and the remaining members are from the Government health departments or institutions, universities, and non-governmental organizations related to science, health, nutrition, education, population studies and development. The tenure of the present committee lasts till December 1995. The Chairman is Prof. M.A. Matin, the Vice-chairman is Prof. Kamaluddin Ahmad, and the Member-Secretary is Dr. Demissie Habte. The 1994 members were:

ICDDR,B: Director; Division Directors of CSD, LSD, CHD, and PFPD.
Board of Trustees: Prof. J.R. Hamilton, Prof. Chen Chunming, Dr. Y.Y. Al-Mazrou.
Government of Bangladesh: Directors General of Health Services; Family Planning; and of NIPORT; Joint Secretary (Health), Ministry of Health and Family Welfare; Directors of IEDCR, IPGMR, Institute of Public Health (IPH), National Institute for Preventive and Social Medicine (NIPSOM), Institute of Public Health Nutrition (IPHN), MIS Unit of Directorate of Family Planning, and of the Cancer Hospital and Research Institute; Project Director, CDD Programme.
Others: Prof. M.A. Matin, Prof. Kamaluddin Ahmad, Prof. Nurul Islam, Prof. T.A. Choudhury, Prof. K.A. Monsur, Maj. Gen. (Retd.) M.R. Choudhury, Dr. Humayun K.M.A. Hye, Dr. Zafrullah Chowdhury, Brig. (Retd.) M. Hedayetullah, Dr. A.K. Khan, Dr. Mobarak Hossain, and Dr. Sultana Khanum; Vice-chancellors of Bangladesh Agricultural University, Bangladesh University of Engineering & Technology, Dhaka University, Rajshahi University,

Chittagong University, Jahangirnagar University, Khulna University, Islamic University, and Shahjalal University of Science & Technology; Chairman of the Bangladesh Agricultural Research Council, and BCSIR Laboratories; Research Director, Bangladesh Institute of Development Studies; Medical Director, BIRDEM; Directors of Institute of Nutrition & Food Science, Dhaka University; BIRPERHT; Institute of Bangladesh Studies, Rajshahi University; Underprivileged Children's Education Programme; and of Bangladesh Medical Research Council; Programme Director, Bangladesh Rural Advancement Committee (BRAC); Professor of Paediatrics, Dhaka Shishu Hospital; Prof. S.M. Nurul Alam, Department of Anthropology, Jahangirnagar University.

In a joint meeting held in June 1994, the ICDDR,B Board of Trustees and the Standing Committee of PCC, discussed issues related to strengthening of research capabilities of the national institutions and discussed the report on collaborative activities between the Centre and national institutions presented by the Director.

The following PCC-collaborative protocols were supported by the Centre in 1994; the total cost was US$ 29,296:

(a) A study to determine the impact of intervention to reduce the maternal, neonatal and perinatal deaths in rural areas-PI: Prof. M.A. Matin from Sirajganj Maternal & Child Health Centre, Sirajganj (completed in June).

(b) Antigenic characterization of human rotavirus serotypes by ELISA and RNA electropherotyping in Mymensingh-PI: Prof. Muzahed Uddin Anmed, Department of Medicine, Faculty of Veterinary Science, Bangladesh Agricultural University, Mymensingh (completed in November).

(c) A study on health related behaviour among the primary school children-PI: Dr.M. Nazmul Haq, Assistant Professor, Institute of Education and Research, Dhaka University (expected completion date June 1995).

(d) Studies on streptococcal pneumoniae, a major cause of child mortality in Bangladesh-PI: Dr. Samir K. Saha, Assistant Professor, Department of Microbiology, Dhaka Shishu Hospital, Dhaka (expected completion date June 1995).

The Centre's scientists provided technical assistance and guidance to the scientific staff of the national institutions in developing research proposals and undertaking research in their own institutions. Investigators from national institutions also participated in several ongoing research protocols at the Centre.

The Research Review Committee (RRC): RRC reviews all research proposals of the Centre with regard to their scientific merit, competence of the PIs, relevance to the Centre's objectives, priorities and financial resources. The Committee is composed of clinicians, social scientists, epidemiologists, laboratory scientists and demographers both from within and outside the Centre. During 1994, the RRC met ten times and considered 24 protocols. The members of RRC in 1994 were:

Dr. Demissie Habte-Chairman
Prof. Kamaluddin Ahmad
Dr. Sajeda Amin
Dr. M.J. Albert
Dr. P.K. Bardhan
Maj. Gen. (Retd.) M.R. Choudhury (up to May)
Prof. T.A. Choudhury
Dr. M. Moyenul Islam (up to June)
Dr. Dilip Mahalanabis
Prof. R. Bradley Sack (up to June)
Dr. Michael A. Strong
Prof. Md. Nazrul Islam (since October)
Dr. James L. Ross (since October)

The Ethical Review Committee (ERC): ERC is a committee which meets regularly to examine the

ethical issues of research protocols involving human subjects, and clears the protocols before studies are undertaken. It has fifteen members: four from the Centre, one each from the PCC Standing Committee, Bangladesh Medical Research Council (BMRC) and WHO in Bangladesh, and the remaining eight persons represent different disciplines.

In 1994, the ERC met nine times and considered 20 protocols, including two PCC-collaborative protocols. During the year, the members of the Committee were:

Dr. D Mahalanabis, Paediatrics, ICDDR,B
Dr. K.M.A. Aziz, Anthropology, ICDDR,B
Dr. M.A. Salam, Clinical Science, ICDDR,B
Ms. Husna Ara Begum, Nursing, ICDDR,B
Dr. S. Rahman, Community Medicine (external)
Dr. Rafiqur Rahman, Legal practice (external)
Ms. Sayeda Rowshan Qadir, Women's Affairs (external)
Dr. Mahmuda Islam, Social Science (external)
Brig. Q.M.S. Hafiz, WHO in Dhaka (external)
Prof. S.A.R. Chowdhury, Pharmacology (external)
Prof. Farida Huq, Microbiology (external)
Dr. Halida Hanum Akhter, Population Science (external)
Prof. Khursheed Jahan, Nutrition (external)
Prof. M.A. Majid, General Surgery (external)
Prof. A.B.M. Habibur Rahman Choudhury, Religion (external)

Animal Ethics Experimentation Committee (AEEC): AEEC was established by the Centre to ensure compliance with standard procedures and rules for protection and welfare of research animals at the Centre. The Committee is required to give clearance to protocols involving research using animals prior to RRC consideration, and to ensure proper management of laboratory animals at the Animal Resources Branch of ICDDR,B. AEEC met on two occasions during the year and gave clearance to three studies involving animals. The members of the Committee were:

Dr. M.A. Jalil (Veterinary and Animal Husbandry) - Chairman
Prof. A.N.M. Abdul Qadir (Parasitologist)
Dr. Abu Tweb Abu Ahmed (Zoologist)
Mr. S.E. Kabir (lay person)
Dr. M. Moyenul Islam (Pathologist, ICDDR,B) - up to June
Dr. K.A. Al-Mahmud (Veterinarian, ICDDR,B)
Dr. Md. Afzal Hossain Miah (Virologist)
Dr. Firdausi Qadri (Immunology, ICDDR,B from July)

The Council of Division Directors: The Council is a consultative management body comprising the Director and the Division Directors. They meet each week to advise and assist the Director, discuss matters of mutual interest, and make policy decisions. The members of the Council in 1994 were:

Dr. Demissie Habte, Director
Dr. Dilip Mahalanabis, CSD
Dr. R. Bradley Sack, CHD and LSD (until June)
Dr. K.M.A. Aziz, CHD (from October)
Dr. M. John Albert, LSD (from July)
Dr. Michael A. Strong, PFPD
Mr. Kenneth J.J. Tipping, Finance
Mr. M.A. Mahbub, A&P
Mr. Graham A.N. Wright, ER&ID
Ms. Judy Chowdhury, Minute Secretary until June
Ms. Julie Banfield, Minute Secretary from June

Consultative Management Committee (CMC): The meetings of CMC are held twice a year, following Board of Trustees meetings. Membership of the Committee is decided within each division and generally is made up of approximately four representatives covering different levels of the division's staff and activities. The Committee was established as a strategy to broaden the base of decision-making at the Centre and to create a forum for exchange of views on issues related to policy. It is also designed to disseminate deliberations of the Board to the staff. The meeting is a two-way communication between management and staff. The Director reports to the meeting on the decisions made at the previous Board meeting as well as on other matters, and there is discussion on those issues. The second item on the agenda is an opportunity for staff representatives to raise issues on policy matters concerning the Centre and its staff. Information on matters discussed in the meeting is intended to be

disseminated to all staff through the division representatives.

Staff Welfare Association

President: Kh. Abdullah Al-Mahmud

The Staff Welfare Association (SWA) is a recognized body of the Centre. The Director of the Centre is the Patron-in-Chief of the Association. SWA has two constituencies, one at Dhaka and the other one at Matlab Health & Research Centre (MH&RC). The President of SWA is elected by the staff of Dhaka and Matlab. SWA is unique in that all Bangladeshi staff beginning from GS level-I through the level of Division Directors are eligible to become a member of the Association. The primary objectives of this body are: (a) to monitor the general welfare of the staff of the Centre, and (b) to organize cultural and social functions. The SWA also plays a vital role in maintaining a good working relationship between the administration and the employees.

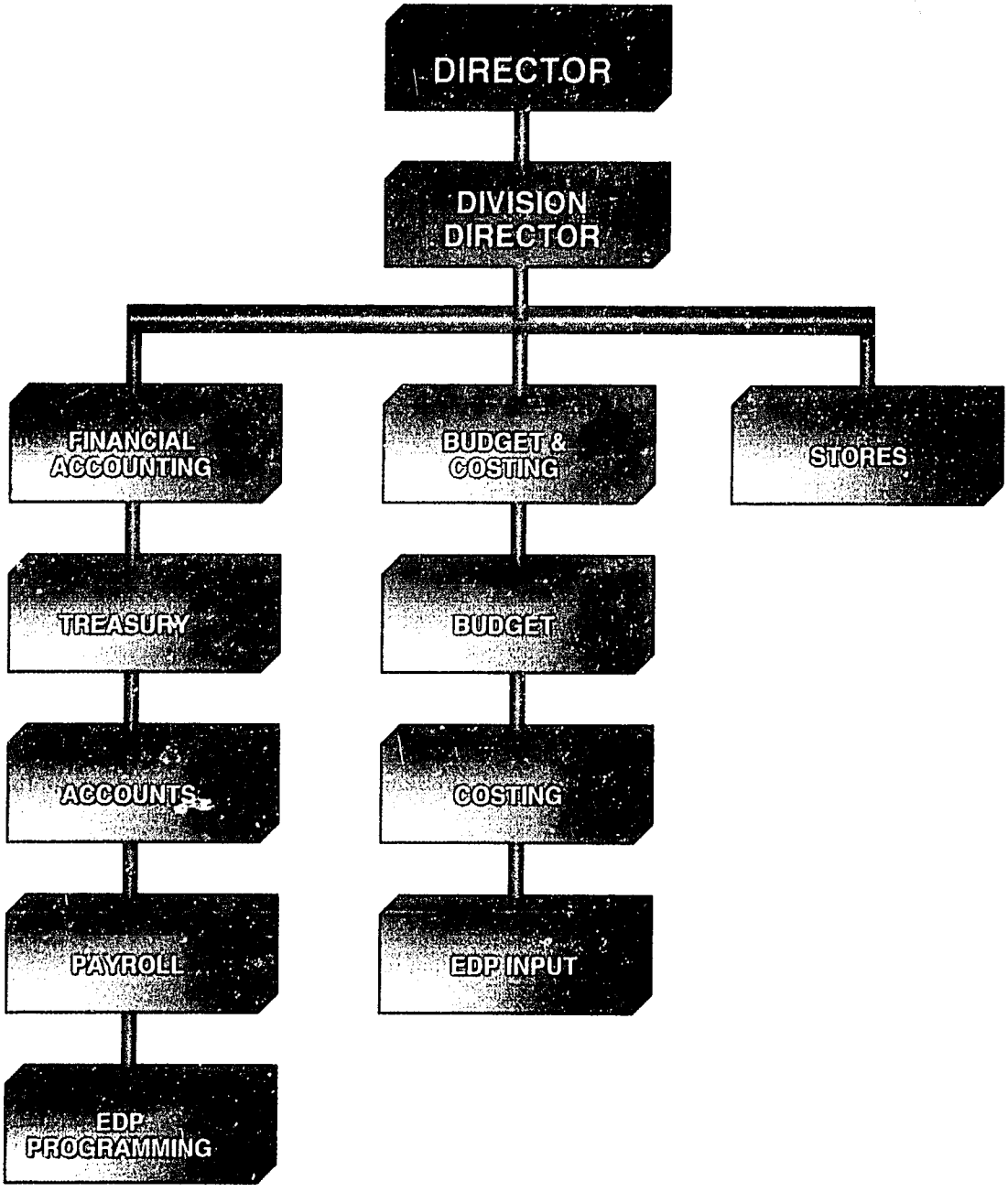
During 1994, SWA organized an annual picnic, a cultural show, established the Creche for the benefit of the female workers of the Centre and negotiated several financial enhancements for the staff. The elected Executive Committee was as follows:

Fakrul

Installation ceremony of the 1994 office bearers of SWA

Position	Dhaka	Matlab
President	Kh. Abdullah Al-Mahmud	–
Vice-president	Ibrahim Bhuiyan	Md. Shahadat Hossain
General Secretary	Md. Abul Hossain	Md. Ali Azam Khan
Joint Secretary	Md. Abul Kalam	Shaikh Abdul Jabbar
Treasurer	Ms. Santona D'Cruze	Md. Sukkur Ali
Athletic Secretary	Md. Nazrul Islam	Jainal Abeddin Miah
Social & Entertainment Secretary	Md. Harun-ur-Rashid	Rehan Uddin
Literary & Cultural Secretary	Nazmul Ahsan	Md. Abdul Malek Patwary
Members of the Executive Committee	Osman Ali, Md. Sayeed Ali, Abdus Sobhan II, Md. Ismail Hossain, Md. Sirajul Islam, Abdul Khaleque and Abdul Mannan I	

FINANCE DIVISION



FINANCE DIVISION

Division Director: Kenneth J. J. Tipping

The Finance Division has overall responsibility for the financial operations of the Centre, in particular to:

- assume custody of all funds and property (including the ICDDR,B Hospital Endowment Fund), and to safeguard, manage and invest the funds and property in accordance with approved policies;
- assume responsibility for improvement, revision and development of financial systems and procedures;
- coordinate and supervise the preparation of the Centre's budget, and then ensure that financial transactions and commitments are within approved budgets and authorization limits;
- perform accounting and control functions, financial planning and reporting, and preparation and payment of payrolls, and then ensure that adequate internal control and division of duties exist so that the accuracy and integrity of the transactions and records can be confidently relied on;
- ensure that procedures and controls comply with statutory and donor regulations;
- record financial transactions and commitments in such a manner that accurate and timely financial reports (monthly, Board of Trustees, annual and donor) can be prepared;
- have full responsibility for all functions related to financial management of the Centre; and
- have care and custodianship of inventories.

In 1994, ICDDR,B was severely affected by a major reduction in contributions to its central activities and even though contributions to projects increased the overhead from projects was insufficient to offset this reduction.

- Contributions from donors after deducting contributions for fixed asset expenditure of US$ 364,156 (1993 US$ 176,460) increased by 1.1% from US$ 9,994,034 to US$ 10,104,082.
- Net expenditure after deducting miscellaneous receipts of US$ 675,591 (1993 US$ 786,173), but excluding depreciation, increased by 5.8% from US$ 10,044,002 to US$ 10,628,240.
- The operating cash deficit was US$ 524,158 (1993 US$ 49,968) which after charging depreciation of US$ 719,818 (1993 US$ 706,095) resulted in a net deficit for the year of US$ 1,243,976 (1993 US$ 756,063).
- Net current assets increased by US$ 2,020,283 due to an increase of US$ 3,934,078 in cash and deposits (includes US$ 3 million donation to the ICDDR,B Hospital Endowment Fund from Swiss Development Cooperation) which was offset by an increase of US$ 1,824,490 in net donor advance contributions and an increase of US$ 89,305 in net other current liabilities.
- The ICDDR,B Hospital Endowment Fund increased from US$ 116,944 to US$ 3,163,953 mainly due to a donation of US$ 3,000,000 from the Swiss Development Cooperation.

Despite continuing hiring austerity and strict control over expenditure, the Centre was unable to generate an operating cash surplus for the year. Accordingly, unfunded depreciation has increased to US$ 6,646,528 (1993 US$ 5,927,836).

Auditors' Report
to the Board of Trustees of
International Centre for Diarrhoeal Disease Research, Bangladesh

We have reviewed the following abridged financial statements comprising the Balance Sheet, Statement of Income and Expenditure and Source and Application of Funds which contain information extracted from the accounting records of the International Centre for Diarrhoeal Disease Research, Bangladesh for the year ended December 31, 1994.

We confirm that the information set out in the following abridged financial statements is consistent with that contained in the audited financial statements for the year ended December 31, 1994 on which we have expressed an unqualified opinion.

HODA VASI CHOWDHURY & CO.
Chartered Accountants

DELOITTE HASKINS & SELLS
Chartered Accountants

Dhaka, March 20, 1995

Asem Ansari

The Secretary (ERD), Ministry of Finance, Government of Bangladesh and a member of the Board of Trustees, with the Acting Director, Division Director, Finance and the Auditors signing the 1994 annual financial statements

Balance Sheet (US$ 000) - Abridged

	1994	1993
Assets	**16,126**	**11,860**
Cash and deposits	8,571	4,637
Accounts receivable	2,668	2,545
Inventories	408	423
Property, plant and equipment	4,479	4,255
Total liabilities and fund balances	**16,126**	**11,860**
Liabilities	**6,253**	**4,232**
Accounts payable and other	6,253	4,232
Fund balances	**9,873**	**7,628**
Fixed assets	4,479	4,255
Fixed asset acquisition and replacement	301	873
Reserve	2,352	2,281
ICDDR,B hospital endowment	3,164	117
Operating	(423)	102

Statement of Income and Expenditure (US$ 000) - Abridged

	1994	1993
Income	**10,780**	**10,780**
Donors' contributions	10,468	10,170
Other items - net	312	610
Expenditure	**12,024**	**11,536**
Personnel	7,612	7,018
Depreciation	720	706
Other items	3,692	3,812
Operating deficit	**1,244**	**756**

Source and Application of Funds (US$ 000) - Abridged

	1994	1993
Sources	**4,899**	**1,172**
Operating (deficit)/surplus after adjusting for non cash items	(504)	(52)
Increase in fund balances	3,489	728
Decrease in non cash net current assets	1,914	494
Other items		2
Applications	**965**	**819**
Additions to fixed assets	965	819
Increase in Funds	**3,934**	**353**
Cash and Deposits		
January 1 1994	4,637	4,284
December 31 1994	8,571	4,637

Donors' Contributions (US$ 000)

	1994	1993
Revenue Contributions	**10,468**	**10,170**
Asian Development Bank	33	
Arab Gulf Fund	250	250
Australia - AIDAB	299	211
Bangladesh	187	114
Bayer AG	73	73
Belgium - BADC	341	280
Canada - CIDA	354	800
CARE	22	13
China	20	20
Denmark - DANIDA	89	187
Family Health International	15	
Ford Foundation	270	302
IDRC	90	89
Japan	684	367
Johns Hopkins University	64	
Netherlands	454	
Norway - NORAD	122	134
Rockefeller Foundation	30	39
Saudi Arabia	58	58
Sweden - SAREC	528	383
Switzerland - SDC	1,420	1,266
- Red Cross	148	
University of California	23	22
United States - USAID	3,513	3,491
- NIH	37	28
UNDP/WHO	350	350
UNFPA	124	224
UNICEF	305	301
United Kingdom - ODA	488	417
WHO	53	77
Disaster relief		603
Others	24	71
Capital Contributions - Sasakawa Foundation		400

Contributions in 1994 from Others were received from European Union, Helen Keller International, International Atomic Energy Centre, Macro International, Sight and Life, Smith Kline French, Stichting Redt De Kinderen and Wander Ag.
1994 contributions in kind, for specific and general activities, were received from Bangladesh, Belgium, Child Health Foundation, Population Council and Republic of Korea.

Donations in 1994 to the ICDDR,B Hospital Endowment Fund included $3,000,000 from Swiss Development Cooperation.

Director
ICDDR,B

Member
Board of Trustees

HOSPITAL ENDOWMENT FUND CONTRIBUTIONS 1994

Foundations, Trusts, Agencies

ACCESS Computer Ltd.
ACME Laboratory Ltd.
Ali Automobiles
American Express Bank Ltd.
A.Q. Chowdhury & Co.
Berger Paints
BEXIMCO
Business Point
Child Health Foundation, USA
CIPROCO Computers
Computer Info. Tech.
Duncan Brothers
Fisons (Bangladesh) Ltd.
Ganges Travels Ltd.
GEC (Bangladesh) Ltd.
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Reliance Insurance Co.
Royal College of Defense Studies
The Scobie & Claire Mackinnon Trust
Swiss Development Cooperation
United Leasing Co.

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Dr. David Sachar and Mrs. Sachar*
Dr. R.B. Sack and Mrs. Jo Sack*
Dr. John D. Snyder
Mr. Chris Underhill

Gifts and Prizes

Bangladesh Biman Airlines
Bengal Fine Ceramics Ltd.
British Airways
Dhaka Sheraton Hotel
Eastern Diplomatic Services Ltd.
EMIRATES, Airline of the UAE
Ganges Travel Ltd.
Japan Airlines
Lemon Grass
National Warehouse Ltd.
Omni Trans Ltd.
Otobi Ltd.
Panda Garden
Raymond Garments Pvt. Ltd.
Sajna
Sheba Printers
Dr. A.K.M. Siddique
Thai Airways International
Transworld Airlines Inc.

Slimathon

Mr. Albert Mehr and
all those who participated
in the Slimathon

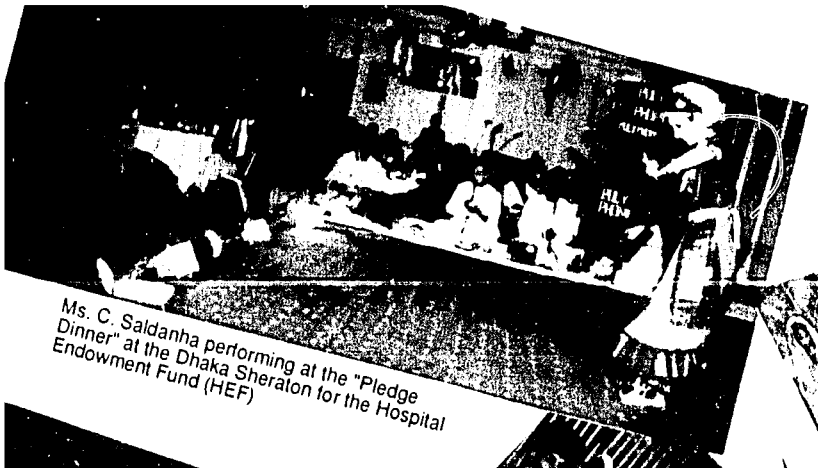
Sale Proceeds and Misc. Sources

Dhaka Hospital Mahila
Kallyan Samabaya Samity
Employees' Multi-purpose
Cooperative Society
Fund-raising dinner
Donated paintings
Matlab book
Mugs and T-shirts
Raffle Tickets
Travellers' Clinic

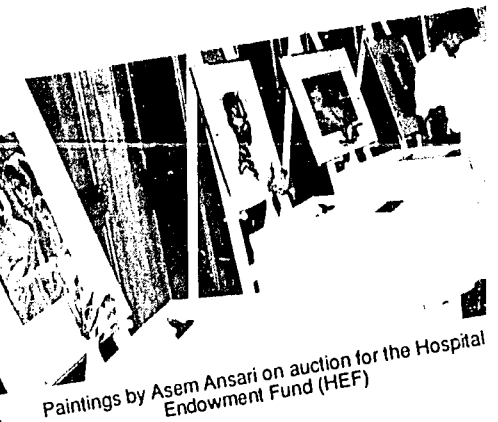
(Donors are listed in alphabetical order)

*Gifts made through the Child Health Foundation (CHF). The Board of Trustees of the Child Health Foundation voted in 1991 to accept contributions on behalf of ICDDR,B from residents of the USA, thereby providing the donor a tax credit. CHF is an action agency whose mission is to support the development of practical, low-cost methods to prevent and treat the most common afflictions of children in under-served areas of the USA and in developing countries in all parts of the world. Donations can be made through the Child Health Foundation, 10630 Little Patuxent Parkway, Century Plaza, Suite 325, Columbia, MD 21044, USA.

Extra-Cur



Ms. C. Saldanha performing at the "Pledge Dinner" at the Dhaka Sheraton for the Hospital Endowment Fund (HEF)



Paintings by Asem Ansari on auction for the Hospital Endowment Fund (HEF)

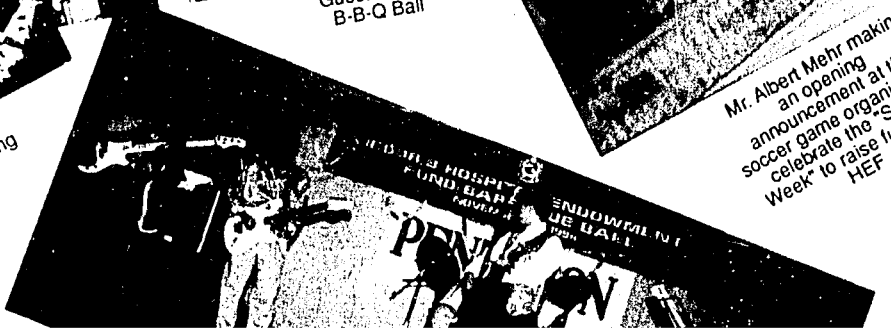
Mr. Nafiz Imtiaz, BTV Newscaster, MC at the B-B-Q Ball for HEF

Mr. N. Kundu, Otobi, giving away a prize at the B-B-Q Ball

Dr. D. Habte poised for the "kick-off" at the soccer gam for the Hospital Endowme Fund (HEF)

Guests at the B-B-Q Ball

Mr. David Piel, USAID, Master of Ceremony (MC), bidding Dr. Mahalanabis farewell at the fund-raising event for the HEF



Mr. Albert Mehr making an opening announcement at the soccer game organized to celebrate the "Swiss Week" to raise funds f HEF

ular Events

Farewell to Dr. A. S. Muller, Member, ICDDR,B Board of Trustees

AVCom video filming on the Centre and Matlab

Farewell to Dr. T. Wagatsuma, Member, ICDDR,B Board of Trustees

ICDDR,B team at the "Swiss Week Marathon"

Swiss team at the "Swiss Week Marathon" for HEF

Dr. D. Habte flanked by Mr. and Mrs. Albert Mehr at the soccer game

A participant of the "Slimathon" organized to raise funds for HEF

Photo: Asem Ansari

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Entnes in Publications, Committees, Visitcrs, Inter-divisional Scientific Forums, Long Service Awards, Obituary, and Hospital Endowment Fund Contributions 1994 are not included

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Who Support the Centre ?

Over the years the work of the Centre has been supported by over 50 nations and organizations that share the Centre's concern for the problems of developing countries and value its proven experience in helping to solve these problems.

Major donors for 1994 included (in alphabetical order) the aid agencies of the governments of Australia, Bangladesh, Belgium, Canada, China, Denmark, Japan, Korea, the Netherlands, Norway, Saudi Arabia, Sweden, Switzerland, United Kingdom, and United States; international organizations, including the Arab Gulf Fund, Asian Development Bank, European Union, International Atomic Energy Agency, International Development Research Centre, United Nations Development Programme, UN Fund for Population Activities, United Nations Children's Fund, and the World Health Organization; and foundations, including Child Health Foundation, Ford Foundation, Population Council, and Rockefeller Foundation; private organizations, including Bayer AG, CARE, Family Health International, Helen Keller International, Macro International, Procter & Gamble, Sight & Life, Statistica Inc., Stichting Redt de Kinderen, Swiss Red Cross, Wander Ag; and academic institutions, including the Johns Hopkins University, the University of California-Davis, University of Iowa, and University of Virginia.

The Centre has developed a fund-raising plan to build a Centre Fund of $20 million to provide stable, flexible income and the edge of excellence for the future.

Computing Facilities: The Centre operates an IBM 4361 mainframe computer with eight megabytes (MB) of real memory and an on-line storage capacity of 3,000 MB. It is connected to 25 terminals. This system provides the capacity to analyze large data sets and is complemented by over 250 personal computers scattered throughout the Centre. New e-mail facilities have been established in the Centre.

Dissemination and Information Services Centre: The Dissemination and Information Services Centre (DISC) provides access to the scientific literature on diarrhoeal diseases, nutrition, population studies, and health in general by means of MEDLINE, AIDS and POPLINE databases on CD-ROMs, and Current Contents on diskettes, books and bound journals, 403 current periodicals, etc. DISC publishes the quarterly Journal of Diarrhoeal Diseases Research (and bibliography on diarrhoeal diseases within the Journal), two bi-monthly newsletters Glimpse and ICDDR,B News, a quarterly newsletter Shasthya Sanglap in Bangla, working papers, special publications, and monographs.

Staff: The Centre currently has over 200 researchers and medical staff from more than ten countries doing research and providing expertise in many disciplines related to the Centre's areas of research.

What is the Centre's Plan for the Future ?

In the 35 years of its existence ICDDR,B has evolved into a busy cosmopolitan research centre whose scientists have wide-ranging expertise. Future research will be directed towards finding cost-effective solutions to the health and population problems of the most disadvantaged people in the world. The Centre's Strategic Plan: "To The Year 2000" outlines work in three key areas:

Child Survival: Diarrhoeal diseases are responsible for the deaths of 3 million children every year. Acute and persistent diarrhoea and dysentery will remain priority areas for research on strategies for prevention including behavioural modification in personal and domestic hygiene, provision of appropriate water supply and sanitation to the household, and the development of effective vaccines. The Centre's scientists will contribute to the improvement of the case management of diarrhoea based on better understanding of basic mechanisms, and national and international responses to epidemics. Acute respiratory infections, nutritional deficiency states (including micro-nutrients) and immunization-preventable infectious diseases will also be examined, particularly as they interact with diarrhoea.

Population and Reproductive Health: The Centre has a long history of conducting pioneering research in the areas of population and family planning. The Centre played a key role in raising the contraceptive use rate among women of reproductive age in Bangladesh to almost 45% through technical assistance and operations research. So much so that the 1994 Cairo Conference hailed Bangladesh as a family planning success story. Matlab is now the model for MCH-FP programmes throughout the world, and the Centre is poised to make important contributions to maternal health and safe motherhood. In addition to continuing work in these three areas, the Centre has initiated community-based research into STD/RTI/HIV infections.

Application and Policy: The Centre will continue to play a major part in improving both the supply of and demand for existing health technologies, and in replicating the successful interventions piloted in its projects through health systems research. The Centre will increase its communication, dissemination and training efforts to influence international and national health policies in the areas of its expertise. ICDDR,B recognizes, and has given a high priority to, the need to transform research findings into action.

What is the Centre for Health and Population Research (ICDDR,B) ?

CENTRE FOR HEALTH AND POPULATION RESEARCH

ICDDR,B, or "The Centre", was established in 1978 as the successor to the Cholera Research Laboratory, which had been created in 1960 to study the epidemiology, treatment, and prevention of cholera. The Centre is an independent, international, non-profit organization for research, education, training, and clinical service.
Located in Dhaka, the capital of Bangladesh, the Centre is the only truly international health research institution based in a developing country. Research findings developed at the Centre provide guidelines for policy-makers, implementing agencies, and health professionals in Bangladesh and around the globe. Researchers at the Centre have made major scientific achievements in diarrhoeal disease control, maternal and child health, nutrition, and population sciences. These significant contributions have been recognized worldwide.

How is the Centre Organized ?

The Centre is governed by a distinguished multinational Board of Trustees comprising researchers, educators, public health administrators, and representatives of the Government of Bangladesh. The Board appoints a Director and Division Directors who head the four scientific divisions and the support divisions of Finance, and Administration and Personnel.

The **Clinical Sciences Division** provides health services at the ICDDR,B Treatment Centre in Dhaka, undertakes clinical and nutrition research, and trains Bangladeshi physicians and other health professionals in the clinical management of diseases and in research methodology.

The **Community Health Division**, composed of public health professionals, anthropologists, economists, environmental engineers, and nutritionists, studies community-based approaches to improving health and reducing fertility. This Division is responsible for the Maternal and Child Health-Family Planning (MCH-FP) Project, which studies health service delivery systems in rural Matlab; the Centre's social and behavioural research programme; the Epidemic Control Preparedness Programme; the Environmental Health Programme; and the Matlab Clinical Research Programme undertakes clinical research, offers treatment for diarrhoea to residents of the area and supports community-based research.

The **Laboratory Sciences Division** has a research programme with branches in enteric bacteriology, molecular biology, bacterial genetics, environmental microbiology, histopathology, immunology, virology, parasitology, and biochemistry and nutrition; and a laboratory service programme with branches in bacteriology and clinical pathology, biochemistry and microbiology.

The **Population and Family Planning Division** includes the Demographic Surveillance System (DSS) which collects longitudinal data on a population of about 200,000 as a basis for a variety of health and family planning studies; the two (urban and rural) MCH-FP Extension Projects which undertake operations research and offer technical assistance to the Government of Bangladesh and Non-government Organizations in implementing the Centre's research findings; and the Population Studies Centre.

The **Training Coordination Bureau** coordinates efforts to provide a broad training programme that aims to contribute towards the development of global human resources in child survival and population programme research, planning and implementation.

(see inside of the back cover....)

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