INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

REPORT OF THE

BOARD OF TRUSTEES MEETING

JUNE 13-15, 1983

APPROVAL OF AGENDA

ICDDR,B BOARD OF TRUSTEES

13-15 JUNE 1983

NEW YORK

AGENDA

1. Approval of Agenda
2. Approval of Draft Minutes of Board Meeting, December 1982
3. Matters Arising
4. Director's Report
5. Resources Development Report
6. Finance Committee Report
7. Approval of FY1982 Audit Report

7a Selection and Remuneration of Auditor

8. Presentation of FY1984 Budget
9. Programme Review and External Scientific Report

9a Vaccine Trial

10 Report of the Ad Hoc Search Committee

11 Report of the Personnel and Selection Committee

12 Selection of Trustees

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APPROVAL OF MINUTES OF BOARD MEETING, DECEMBER 1982

MINUTES OF THE MEETING OF THE BOARD OF
TRUSTEES, ICDDR,B DHAKA, 6-8 DECEMBER, 1982.

Members Present:

Mr M.K. Anwar
Dr H. Al-Dabbagh
Dr F. Assaad
Dr D. Bradley - Chairman
Dr W.B. Greenough - Secretary
Maj. Gen. Shamsul Haq
Dr J. Holmgren
Dr G. Jones
Dr J. Kostrzewski
Dr L. Mata
Dr M.A. Matin
Dr J. Sulianti Saroso
Dr Y. Takeda
Dr M. Were

Members Absent:

Prof. D. Bell, Dr V. Ramalingaswami

At 9 a.m. the Chairman opened the meeting and welcomed the three new Board members:

Major General Shamsul Haq
Dr Yoshi Takeda
Prof. David Bell

He noted that Professor Bell had informed the Board prior to his appointment that he could not attend this meeting due to a long stand-

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ing commitment prior to his nomination to the Board.

Major General Shamsul Haq (Doc. 1/BT/Dec. 82) addressed the Board and observers. He expressed pleasure at serving on the Board and mentioned that the external review process in 1982 and current attention to programme planning by the Board as helpful in guiding the Centre in the most effective path. Since his home village is in Matlab Thana he has long known and admired the work of the Centre and its predecessor, the Cholera Research Laboratory. The support in cash, facilities and the donations of land indicates strong support of the Centre by the Government of Bangladesh. He expressed appreciation at the recent close coordination of the Centre's work with the Health Ministry, emphasizing the importance of communication of knowledge to other developing countries to enhance the Centre's international character.

Dr Takeda then expressed his pleasure at becoming a Member of the Board. He noted that as a bacteriologist he especially looks forward to learning more about the Centre's work in the area of his discipline which is fundamental to the control of diarrhoeal illness.

The Chairman remarked on the high quality of previous Chairmen as a standard to emulate. He thanked the Director and his staff for their successful efforts in the past six months in improving the Centre's financial position. He welcomed the representatives of donor agencies and countries who had taken part in the previous week's programme review both as observers and reviewers noting the wide participation which included Australia, Belgium, Switzerland, United States, UNDP, UNICEF and WHO. Special thanks were offered to Dr Krzysko of WHO/SEARO for his active participation.

Agenda 1: Approval of Agenda

The Agenda was approved.

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Agenda 2: Approval of Draft Minutes of Board Meeting, June 1982

The minutes of the meeting 14-15 June, 1982 were approved along with the additional two resolutions circulated before the present meeting, and confirmed them, namely,

Resolution 23/June 82

Resolved: The Board authorizes the Director to negotiate with the Centre's bankers for a temporary overdraft amount of $1,000,000 which will be utilized to bridge the gap arising from the timing of cash inflow against cash expenditure. This overdraft facility is to be retired against funds as and when they are received from the Centre's donors.

Resolution 24/June 82

Resolved: The Board authorizes the Director to transfer the present Severance Pay Fund held in Taka, to an external Dollar deposit account with a Bangladeshi nationalized bank, pending coversion of the Severance Pay Account into a Staff Pension Scheme.

Agenda 3: Matters Arising

There were no matters arising.

Agenda 4: Director's Report

The Director presented his report (Doc. 4/BT/Dec. 82). The Trustees indicated appreciation on the cooperation of all staff in achieving the positive financial results reported. The transfer of patients to the new building on 29 November, 1982 was noted. Analysis of failure to meet an earlier target date could avoid over optimistic scheduling during the second phase of construction. Early mobilizatior

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of funds was urged for the second phase. The organization of the Ordinance-mandated Programme Coordination Committee was acknowledged and formal action by the Board deferred to the agenda on Programme Review. The tax exemption status was noted and further action encouraged. The discovery of diseases such as Reye's Syndrome, Yersinia enterocolitica and necrotizing enterocolitis for the first time in Bangladesh was noted. The importance of recruiting new leadership in science and training was stressed as most essential for continued pre-eminence of the Centre. A recently completed slide and sound presentation on the ICDDR,B was shown to the Trustees and observers.

RESOLUTION 1/DEC. 82

The Centre is encouraged to continue to pursue the matter of exemption from income tax for its Bangladeshi staff. It was noted that this is consistent with the policy of the Government of Bangladesh not to tax the Bangladeshi staff of UN agencies in Bangladesh.

The Chairman of the Board then outlined principles to be followed in the remainder of the meeting. He noted that an individual Trustee had interacted with each programme and its staff. The points raised by the recent External Reviewers were addressed. Improvements in the financial system allow the programme to be linked to the budget and priorities set which will be reflected in the final budget document.

RESOLUTION 2/DEC. 82

The Board expresses its appreciation of the work of the external reviewers, and has incorporated their numerous important comments into its own review of the programme and budget for 1983 and beyond.

Agenda 5: Resources Development Report

The Associate Director, Resources Development presented his report (Doc. 5/BT/Dec. 82). Appreciation was expressed by all members on the excellent results of the efforts at raising funds. Members inquired carefully concerning the security of projected incomes for 1983. It was noted that projects are now fully costed and all overhead is

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recovered. An example of such a project was USAID supported assistance in control of a cholera outbreak provided by the Centre to the Government of Indonesia this summer. It was noted that the contribution by the United States is due for renewal in October 1983. A review of the work of the Centre is currently in progress by a Technical Team from USAID. Funding at the current level seems quite certain but an increase will be hard to achieve. It was mentioned that the U.S. National Institutes of Health are exhibiting renewed interest in research on diarrhoea and overseas grants may be available again from this source. It was noted that the Arab Gulf Fund through UNICEF would cover existing commitment in Service Training and improvements on Matlab and Teknaf facilities. Interest in reviewing this proposal was expressed by several Board Members. In connection with the efforts by the Centre in Saudi Arabia and the Gulf Region a conference organized by UNICEF in Riyadh in 1982 and in 1983 in UAE gives excellent opportunity to ICDDR,B to communicate knowledge about the Centre in that region. With reference to the function of such conferences the usefulness of the technical participation of ICDDR,B in an International Conference on Oral Rehydration Therapy to be hosted by the United States in Washington D.C., and funded by USAID was noted. This conference will also be an opportunity to expand contact in the PAHO region. Later in 1983 a conference on Campylobacter in cooperation with Belgium will also be co-sponsored by ICDDR,B in Brussels.

The need of careful coordination with WHO was stressed to avoid competition or unnecessary overlapping of efforts. It was noted that recently the head of CDD/WHO, Dr Michael Merson, had visited ICDDR,B and coordination of visits by staff from the Centre in each region had taken place through the appropriate Regional Offices. The complementary nature of the activities of the Centre to WHO/CDD was noted. Insecurity of funds from the Middle East was mentioned, but Dr Al-Dabbagh reported that the Kingdom of Saudi Arabia was ready now to sign a contract with the Centre to assist in establishing the

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necessary diagnostic, epidemiologic and clinical base from which a control programme in the Eastern Region could be mounted.

The difficulties and complexities of fund raising were discussed. It was remarked that the Centre had exceeded its planned targets for income in each of the last three years. To avoid leading donors to have excessive expectations an effort to establish further policy guidelines would be worthwhile. Caution was mentioned in expectations from UNDP and Japan due to income reduction and change in Government.

The Chairman noted measures that could assist the already highly successful efforts of the Centre's fund raising were (1) formulation of policy guidelines, (2) early information to the Board of new initiatives and briefing Trustees on how they could assist in bringing them to fruition, (3) establishing the strongest and most effective possible programmes in research and training.

A group of three Trustees, Dr F. Assaad, Dr D. Bradley and Prof. J. Kostrzewski were asked to suggest guidelines for ICDDR,B technical cooperation with countries in the field of diarrhoeal disease research and training. They suggested the following:

> Before negotiating technical cooperation between the ICDDR,B and country authorities ICDDR,B may request WHO Regional Office for South East Asia, if the country is within that Region, or the appropriate Regional Office, if the country belongs to another Region, for information on national diarrhoeal disease control programmes.
>
> WHO should be informed about the result of negotiation and the proposed technical cooperation programme for comments.
>
> WHO Headquarters will inform ICDDR,B of national programmes in the ICDDR,B priority areas in the field of diarrhoeal disease

research and training.

ICDDR,B involvement in countries outside Bangladesh will primarily be in the area of laboratory, clinical and field research including operational and health services research; in training for research; in development of laboratory and other facilities; and in information on research and training in diarrhoeal disease.

The Board was informed that a special source of funds was available through UNDP. During discussions with UNDP it was indicated that unutilised funds totalling approximately $1 million remaining in the account of the defunct United Nations Relief Operation in Bangladesh (UNROB) could be made available for services and training in Bangladesh, provided concurrence of the Government of Bangladesh was obtained. The Government of Bangladesh has difficulty in concurring with the disbursement of this money as an outright grant but may be agreeable as an interest-free loan to the ICDDR,B. The negotiations for this fund have been complex and extremely strenuous. However, the Director is pleased to report that the fund should be released to ICDDR,B by the close of this year.

The following resolution was passed concerning the Consultative Group Meeting to be held in 1983:

RESOLUTION 3/DEC. 82

The Board approves convening a Consultative Group meeting in New York in June 1983 in conjunction with the UNDP Governing Council meeting.

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Agenda 6: Report of the Finance Committee (Doc. 6/BT/Dec. 82)

The report of the Finance Committee was presented. The Board complimented the Associate Director, Administration & Finance for his remarkable success in reducing costs. It was felt that perhaps with the exception of the cessation of travel of younger scientific staff to meetings to present their work there had been little constraint to the programmes involved in the cost reductions. This makes possible the requisite increases in the 1983 budget for conversion to WHO pay scales together with contingency for possible further pay increases. The two million dollar budget increase over the current 4.5 million dollar performance will not permit significant expansion of programmes. A very conservative position has been presented on cash flow and contingency against the budgeted pay increases. The importance of the Reserve Fund was explained. The importance of using this opportunity to seek matching funds from interested donors was stressed. The need for a careful formulation of the rules of this fund and its early approval by the Board was stressed.

The information on the UNROB fund from the Resources Development Report was noted and the Centre was encouraged to seek their release.

The following resolutions were passed relevant to the Report of the Finance Committee.

RESOLUTION 4/DEC. 82

When the total donor support for FY 1982 of $6.48 million is reached and received by January/February, 1983, it is expected that a credit balance of $914,000 will be available in FY 1983. The Board therefore instructs the Director to set aside $700,000 to start off the "Reserve Fund" and to prepare regulations for its operation to be reviewed by the Finance Committee and reported to the Board at its meeting in June 1983.

RESOLUTION 5/DEC. 82

The Board requests the Director to further pursue the possibility of attracting matching funds from interested donors against the Reserve Fund account.

RESOLUTION 6/DEC. 82

The Board recognises the necessity of temporary cash shortfalls resultant fr differences in timing of receipts of donor support against operating expenditure. The Board authorises the Director to negotiate bridging facilities in the form of bank overdraft up to a maximum equivalent of US Dollars one million. Since the American Express International Banking Corporation, Dhaka, has approved an overdraft facility in Taka of up to Taka 7.0 million, the Board authorises the Director to finalise this overdraft arrangement.

RESOLUTION 7/DEC. 82

The Board further authorises the Director, if it is absolutely necessary and required by the bank, to pledge and charge the assets of the Centre to the bank as collateral for this total overdraft facility of $1.0 million.

RESOLUTION 8/DEC. 82

Since cash shortfalls need to be minimized, the Board instructs the Director that no projects above the budget ceiling set will be allowed to commence until pledged funds for the project are received. Until such time as the donor has demonstrated its interest in the project by mobilising the required funds, the programme head or scientist responsible will not be allowed to start the project.

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RESOLUTION 9/DEC. 82

To protect the severance pay account from further erosion in real terms, and also to earn interest to make up the current shortfall in this account, the Board instructs the Director to pursue the possibility of converting the severance pay account into US Dollars and place this in time deposits. Pursuant to clause 17(2) of the Ordinance, the Board requests the Director to take this matter up with the nationalised banks in Bangladesh. This resolution supercedes Resolution 24/June 82 and any other previous resolutions in this regard.

RESOLUTION 10/DEC. 82

The Board authorises the Director to negotiate terms and conditions and enter into an agreement with the appropriate authorities for the release of the UNROB funds.

Agenda 7: Programme Review, Project Development and Branches

As an introduction to the programme review and formulation process by the Board, the representative of WHO/SEARO, Dr Krzysko, who had actively assisted during the review, presented some of the expectations of ICDDR,B that Regional Diarrhoeal Disease Programme Managers had expressed at their recent meeting in Yogyakarta. Eight countries were present at the Yogyakarta meeting and three absent (Bangladesh, Mongolia and Korea). The focus of the regional programme was on service delivery training, other training and operations research. Most countries have 3-5 persons focussing on diarrhoea as an integral part of their main health programmes.

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Some expectations of ICDDR,B from the region are as follows:-

(1) Training to establish functioning laboratory facilities. Most people now in place have been trained at the Centre.

(2) Production of national teachers to implement national courses is 80% complete. Most have been trained at the ICDDR,B which is considered a prime regional and international resource for this purpose.

(3) Specialized training is now needed in epidemiology and evaluation, operations (health services) research, clinical research, research design and formulation and up-dating courses.

Research needs were stressed. The ICDDR,B is viewed as pivotal to achievement in this area. Emphasis was placed on (1) operational research turned to useful and timely programmatic feedback to programmes, (2) information on morbidity and mortality as related to home use of ORT with alternate means to the packets, (3) sociological research, (4) the role of volunteers, (5) how to utilize existing logistical systems, (6) transmission studies, (7) nutritional aspects, (8) community acceptance of intervention plans, (9) testing the value of traditional medicines.

It was mentioned that sometimes visitors are confused by the broad scope of ICDDR,B research in relation to diarrhoea. This has not been well explained as yet in specific courses. Long term plans through 1985 are needed now by regional managers. Any results of operational research should be made available at an early time. Glimpse would be more useful if it had more news and details of research. A mechanism for this is needed. Perhaps the DISC project will serve this need.

The participation by ICDDR,B at all regional conferences and scientific

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working group meetings is very much desired. The need of field research areas where accurate information could be gathered was discussed together with simpler sampling approaches. A great interest was expressed to learn how ICDDR,B assists the Government of Bangladesh in its national health programmes. It was felt that the Centre was paying insufficient attention to health services research. Several examples of the Centre's work were noted as ideal to teach certain important elements such as the approach to the recent cholera outbreak or the rapid transition of rice ORT from clinical research to field testing.

Programme Review

During the week prior to the meeting of the Board each Programme of the Centre was reviewed by several Trustees and one presented the results to the Board. The comments of the External Review were carefully considered in the final report to the Board. Initially, the Trustees were presented a summary overview by Programme Heads and then intensive meetings with the Programme Heads and members of each working group took place. Each Programme provided a report of activities for 1982 and a plan for 1983 and beyond. The External Reviewer comments were addressed. On the basis of these documents and conferences with the scientific and training staff a statement to the Board was prepared and is summarized in these minutes.

One full day of the Board Meeting was spent in discussions of the Centre's programmes. Attention was focussed on the future with special emphasis given to the setting of priorities and overall conceptual formulation in relation to stated goals. The importance of retaining within each programme as well as across the Centre of funds not specifically assigned to ongoing projects was emphasized. In science unless there is a possibility of new initiatives as opportunities arise and discoveries open new paths a research

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institution will stagnate and rapidly lose its leadership. The Centre on the basis of its recent performance is in the forefront of research in several important areas. This leadership position should be fostered and characterize all programmatic areas. Some projects will have to be delayed or dropped to insure such initiative funds.

(a) Training (Reference Doc. 7.1/BT/Dec. 82)

Dr J. Sulianti Saroso presented the programme for the Board and Drs J. Kostrzewski and M. Were were designated discussants.

The Centre possesses certain unique qualities as an international institution. These strengths should be utilized in the Training Programme. An example would be the availability to trainees of practical settings for genuine experience in the hospital and field in Bangladesh.

Although it was agreed that the Training Programme had accomplished a great deal in its first three years, it was felt that in the plans as presented there was not an adequate focus on how and where to place priorities or what were the overall conceptual goals. With the presentation and discussion a consensus developed that agreed on the following guiding principles:-

(1) There should be an increase in specificity both of the courses and other modalities of Training. The special areas should correlate with areas of work in which the Centre excells and where a practical field, hospital or bench experience are available. For example, instead of a course on field epidemiology a course on the spread and control of cholera would be given.

(2) Training by the Centre outside of Bangladesh should be specific and limited to the expertise of Centre staff. Larger projects can be developed in conjunction with other countries for

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discussion with the Board. They would be entirely contingent on external funding.

(3) There should be a decreased dependency on imported teachers with time. The Programme is now mature enough to do much of its work with internal faculty.

(4) There should be active internal and external evaluation of all training including a good follow-up of what each trainee does in subsequent years. Based on this sharper criteria for selecting participants can be evolved.

(5) There should be a serious plan to present refresher courses for previous trainees. These would serve as current "state of the art" courses for some selected new trainees. These might be termed "Advances in Diagnosis, Management, etc. of Diarrhoeal Diseases". They should be focussed on specific areas such as newer courses of diarrhoea, nutrition during and after diarrhoea, improvements in ORS, etc.

(6) The participants to be chosen should be sharply defined such as Professor of Pediatrics for advances in ORS, or Chiefs of Emergency and OPD's for approaches to Epidemic Management using the Dhaka Treatment Centre as a model.

(7) There should be increasing emphasis on preparing outstanding persons for research careers in their own countries.

There was a uniform agreement that the Centre should not develop a core of people who are exclusively doing teaching or training. It was felt very important to keep all the research staff participating in training within reasonable time limits. The idea that 20-25% of time dedicated for training was agreeable. In recruiting staff this commitment should be emphasized.

It was felt that attempts should be made to provide individual on-the-job training in research for 1-2 years to a few international trainees.

There was also a strong consensus that there should be a far greater internal training effort for the younger staff of the Centre. As a

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part of this much more attention is necessary to the basic quality of the laboratories, hospital and all other facilities. It was stated that a strong upgrading was needed in microbiology, the hospital and treatment centre as well as in the field stations. This upgrading must include simultaneously training the younger staff improving both organization and level of function.

The forthcoming review in January 1983 of training by UNDP/WHO will provide a good opportunity for Dr K.M.S. Aziz to prepare a sound and sharpened forward programme. It was noted that WHO plans to continue funding 3-4 courses each year at the Centre.

There was general support for the concept of regional conferences such as the Asian Conference as a forum for younger scientists to present their findings and thereby gain experience. This goal should be clearly spelled out in seeking support for future such conferences.

With respect to preparation of materials it was felt that the present weakness could be overcome by use of some short term consultation. It was also noted that more use could be made of WHO materials, particularly in relation to the standardization of laboratory methodology. There should be a concerted long term effort to develop the intrinsic capability of the current staff. It was noted that there was great strength in graphics and all the components for an excellent ability in materials development.

There was concern expressed that Dr K.M.S. Aziz was carrying too many activities and required more time for planning as rationalizing overall the Training functions. It was mentioned that Dr Laila Akbar should receive training for short specific areas of Training Methodology outside of Bangladesh.

There was general agreement with the comments by the External Reviewers which were congruent with those noted herein.

(b) Community Services Research Programme (Doc. 7.2/BT/Dec. 82)

Dr Gavin Jones presented the review and Dr Miriam Were was the designated discussant.

There are two dimensions of the Demographic Surveillance System (DSS). One is its unique value as a longitudinal data source during a transitional period in a developing country, Bangladesh. In no other such setting does an accurate instrument exist. The second aspect is whether it should be exported perhaps in a simplified form to provide longitudinal sources of accurate information elsewhere. Beyond this data source lie the issues of the interventions in health which must also be assessed in terms of their cost, effect and transferability out of the Matlab setting.

The External Scientific Reviewers have raised the following points:-

(1) Could the DSS be made simpler and cost less without the loss of accuracy? This question is particularly important to considerations of its usefulness to other countries. A high priority has been given to research on this subject in the 1983-85 period. Some data addressing the frequency of visits and accuracy exists and needs analysis.

(2) For incorporation into the country setting outside of Matlab, sample surveillance approaches are required. Examples now underway are the MCH-FP Munshiganj, Sirajganj, Noapara methods and the BRAC block evaluation approach. Neither of these has been integrated into the main stream of CSRWG research as yet.

(3) Investigation of improved cause of death reporting by non-physicians is well underway, and is seen as important.

(4) Analysis of socio-economic data is well advanced and important.

(5) The linkage of records in DSS is needed. This requires a more advanced computer.

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(6) The analysis of family health inputs of the MCH-FP program Matlab requires analysis. This is planned.

(7) The need for a health economist was noted. The CSRWG sees this as a high priority.

(8) The need for integration of projects requiring health services research which have been under Extension or Project Development was noted as a necessary goal.

The budget of this group is mainly tied to project funds. There is little scope for reductions for this reason. The budgets of individual protocols listed were very small and do not reflect the actual value of the time of the scientific staff. There was not a prioritization of these projects. There was general agreement with the high premium set on analysis of existing data. A careful thinking through of what ideas are to be tested next in the large and intensive data collecting in Matlab MCH-FP is very urgently required. To do this sensibly, analysis of current data is needed. There is a conspicuous lack of small scale socio-anthropological studies designed to establish sound hypotheses which could be tested often by analysis of current or past data directed at specific answers to important questions. There was a clear consensus that a more advanced computer is needed and should be sought together with support for its continuing operation.

A severe weakness was noted in the area of health services research. Most such projects were outside of this group and the main thrusts, past and present, are principally demographic and socio-economic. It was felt that leadership in the area of health services research and operations research was the highest priority to fully realize the assets of the very good demographic base developed here. It was noted that control of diarrhoeal diseases does not seem to have much priority. There is need to assist and solve problems in the National Control Programme for Diarrhoeal Diseases, in particular the services delivery

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component. It was felt that these two components, demography and health services research, should be kept together. It was therefore felt that although some points of the external review had been addressed, the lack of focus and priority on the health services area made the programme document presented unsatisfactory since it lacked what was considered a crucial dimension. An adequate framework with the appropriate cross programme groupsings is needed. Consultation and recruitment will be necessary to solve this problem. Clearly much of the Extension (PDC) work belongs in CSRWG given the proper staffing and leadership in the necessary disciplines. Preservation and further strengthening demographic research is also very important but this aspect has had much more attention recently making significant advances.

(c) Disease Transmission Programme (Doc. 7.3/BT/Dec. 82)

A review of this programme was given by Prof. J. Kostrzewski. Dr L. Mata was the designated discussant. The basis of the comments were presented. The programme and its priorities as presented were felt to be only a compilation of various projects resulting from past ICDDR,B experience and individual interests without conceptual focus. It was proposed to accept the programme as presented for the time being as basis for research activities in 1983. There must be modifications during this year that will lead to a well conceived and focussed programme in 1984. It was deemed essential that the Director, ICDDR,B monitor and seek modification as soon as possible to lead to a sound programme.

For the year 1984 and the following year a new well-conceived and justified research programme should be prepared by the DTWG assisted by a consultant experienced in epidemiological research on diarrhoeal diseases. In this new programme priority areas for research should be defined for 4-5 years. In setting these priorities the following approaches should be taken into consideration:-

(1) Etiology of diarrhoeal diseases by causative agent taking into

account what is known and what is not with respect to etiology, pathogenesis epidemiology and ecology.

(2) In approaching the communities affected attention should focus on groups at special risk (low or high). Social, economic, behavioural as well as environmental factors should be addressed.

(3) Interventions applicable for diarrhoeal diseases prevention and control should be reviewed such as human behaviour e.g. hand washing or technological such as immunization, etc. Attention to the status of present knowledge is essential to set priorities. Special attention must be given the situations in Bangladesh and countries which have the greatest problems. The priorities already set by WHO/CDD should be carefully addressed and consciously incorporated or rejected for explicit reasons.

The new programme for the Disease Transmission Programme should be presented to the Board by June 1983.

There was a strong consensus among all Trustees that urgent attention was needed to recruit a senior epidemiologist, microbiologist, and a younger epidemiologist. Special attention is required to take advantage of the unique situations with cholera epidemics in defined populations such as Matlab. Emphasis on follow up of the hand washing observations and on water ecological studies is needed. There was full agreement with the External Reviewers emphasis in this area. In addition it was noted that a capacity in virology was necessary for any properly comprehensive approach to diarrhoeal diseases. An added note was the comment that field trials need planning well in advance and such planning was not evident on the programme presentation.

(d) Nutrition Programme (Doc. 7.4/BT/Dec. 82)

Dr Leonardo Mata presented the report.

The Nutrition Working Group is a well organised, coordinated and productive research team, judged by the various recent publications, documents and evaluations by visiting scientists to the Centre. This general impression was confirmed by several discussions with the members of the Nutrition Working Group and a review of the plans for the future.

The objectives of the programme for 1983-85 are clear in that they address to the nature and determinants of diarrhoea-malnutrition with the aim for its eventual control and prevention. To comply with the objectives, efforts will be directed at field and laboratory studies: the first with a strong component of epidemiology supported by laboratory studies; the latter with a good base on the experimental method relying on modern laboratory techniques.

The prospectus for 1983-85 clearly took into account priorities of Bangladesh -- which are similar to those of many other less developed countries -- hoping for generating results of imminent broad application for the control and prevention of diarrhoea and its sequelae.

The programme of the Nutrition Working Group will focus on expansion of present knowledge on:-

(1) Pathophysiology of consumption, digestion, absorption and utilization of nutrients during diarrhoea in malnourished individuals.

(2) Management of diarrhoea in the malnourished person.

(3) Socio-cultural determinants and child-rearing practices affecting food-utilization, nutrition, health and growth of children.

(4) Interventions in the community to curtail or prevent diarrhoea and nutrient wastage.

(5) Interventions to increase food consumptions during the

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diarrhoea attack.

(6) Techniques for alimentation of children during the acute phase and convalescence of diarrhoea.

(7) Methods for rapid recuperation of severely malnourished children.

(8) Systems for delivery of maternal and child health care in rural areas.

(9) Promotion of maternal and family care practices to reduce the risk of diarrhoea, malnutrition and death.

The Nutrition Working Group Programme is ambitious and contemplates priorities difficult to rank in view of their relevance. Knowing the scientific contribution of the group in the last three years, in elucidation of the role of diarrhoea in the deterioration of the nutritional status, further contributions are to be expected. Furthermore, the demonstration of simple interventions to curtail infection and diarrhoea, and to reduce the risk of death suggest that field activities of the Nutrition Working Group will yield other benefits in the future.

(A) Hospital-based activities

The demonstration of a reduction in food consumption and nutrient absorption, and the finding of a protein-losing enteropathy in some diarrhoeas (rotavirus, enterotoxigenic Escherichia coli and Shigella) in the last three years, has been followed by other contributions, namely the development of an effective rice powder-electrolyte solution and the discovery of adequate absorption of Vitamin A during the course of diarrhoeal disease. These last two developments have potential immediate application to the solution of common problems in developing countries.

The original observations on the negative effects of diarrhoea on host

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nutrition should be expanded to understand other specific diarrhoeas, namely, Campylobacter, Giardia, Strongyloides and Cryptosporidium. Research on health services should translate the observations on the new oral rice-salt and possibly oral rice-salt-Vit. A preparation to the field situation to measure their potential beneficial effects.

(B) Field-based activities

The nutrition field studies, at Teknaf, are of an ecologic nature and involve the systematic collection of data on growth, morbidity, nutrition and survival of young infants through childhood. The data are complemented by unique detailed microbiologic studies of the pathogenic intestinal flora and by census and nutrition information on the general population especially mothers. Due to the longitudinal nature of the Teknaf studies, and to the magnitude and complexity of the data, the analysis has been limited and expectedly is receiving new impetus by full-time dedication to analyses by the Programme Head. So far, the available information has dealt with the effect of interventions on diarrhoea attack and on overall survival.

However, other analyses are expected, namely, the inter-relationships between intrauterine growth, maternal morbidity and nutrition, breast-feeding and weaning, diarrhoeal disease and nutrition and growth. Analyses should focus on the relationships of diarrhoea to wastage and stunting phenomena taking into account other factors such as fetal maturity, breast-feeding and the nutrient value of food supplements. Such analysis will provide answers regarding the natural history of growth retardation, of the risk of malnutrition, and on onset of severe protein-energy malnutrition.

The examination of reports and discussions by the External Scientific

Review Committee indicate a general agreement with the views expressed in the summary report. One important aspect deserving immediate attention related to weaning foods and the home technology to prepare them and to keep them safe from contamination, and especially the technology to transfer that to the target population. For this specific recommendation, the skills of a dietician and a food chemist are required.

In this regard the Nutrition Working Group consists of a multi-disciplinary team of young scientists, strongly biomedical, but with the benefit of two anthropologists, approaching the desirable socio-biomedical model, the group lacks, however, an epidemiologist, a data analyst and a dietition-nutritionist. The collaboration of professionals with such capacities, and the addition of non-Bangladeshi scientists will strengthen its multidisciplinary and international status.

(e) Pathogenesis and Therapy Programme (Doc. 7.5/BT/Dec. 82)

Dr M.A. Matin presented the programme review with Dr J. Holmgren as discussant. The programme plan was well presented. It was well focussed and conceptualized. As presented there seemed excessive emphasis on pathogenesis with less attention to treatment, but in the deployment of the budget a good balance was noted. The point of the External Reviewers that more physiological studies could be done has been well attended to. It was felt that there could be significant improvement in the Treatment Centre and this must receive the attention of the programme.

It was felt that there should not be an emphasis on antibiotic testing. There should be increased use of laboratory animals for test-

ing clinical and physiological ideas. This should include looking for models which mimic some complications such as the hemolytic uremic syndrome of hypoglycemia.

There was an agreement that work on ORS could be moved to the Nutrition Programme.

Chronic diarrhoea could receive an increased priority but the many implications of this should be noted. The chlamydia studies seem over balanced and too expensive. It was noted that this could be rationalized with the laboratory infra structure for virology if wished. There are excellent laboratories working on chlamydia in Kuala Lumpur, Singapore and Dakar. Communication should be established with these regional institutions. There are many problems with setting up this technology in Dhaka. It was also noted that mycoplasmae deserved attention and were easier to handle.

(f) Host Defence Programme (Doc. 7.6/BT/Dec. 82)

Dr J. Holmgren presented the programme review.

The revised programme of the HDWG for 1983-84 focusses on how the local immune system of the gut responds to etiologic agents of diarrhoeal disease and how the immune response can be stimulated by vaccination to confer protection against diarrhoeal diseases.

Four project areas have been identified as being of the highest priority (priority I) and another three projects as being of lower priority (priority II).

The top priority subjects are:-

(1) Studies of mucosal antibody production and immunologic memory

to entero-pathogens and their products (V. cholerae, ETEC, Shigella, S. typhi, rotavirus).

Three protocols are approved or planned under this heading and one-two others may be started in 1983.

(2) Studies to optimize the mucosal immune response by oral vaccination with purified or complex vaccine candidate immunogens.

(3) Immunization of mothers to increase breast milk antibodies to defined pathogens and evaluation of protective role for the breast-fed child.

(4) Gastric acid as a protective barrier against infection.

The second level of priority projects are:

(1) Experimental studies of local antibody production in animals.

One protocol is approved on "Effects of V. cholerae on antibody production by gut lymphoid tissue of mice".

(2) Passive immunity for treatment and prevention of diarrhoeal diseases.

One protocol is approved on "Modulation of cholera by immune bovine colostrum".

(3) Effect of malnutrition and intestinal parasites on gut immune responses to oral vaccines.

It was noted that the External Scientific Review gave three main recommendations to the Host Defence Programme: (1) With regard to scientific content a high priority area should be "Studies on local intestinal immunity in response to infection on living or killed vaccines (protective immunogens)"; (2) As to staffing "the lack of

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a senior scientist at the Centre with experience in medical immunology is strongly felt"; (3) The need for external collaboration is quite obvious. Such collaboration is established but may have to be enlarged.

The Board found that the revised programme describes reasonable priorities within the scope of the HDWG. In view of the importance of the top priority areas, listed as priority I in the programme plan, the programme should concentrate itself on these projects.

The main problem is to which extent these priority project areas can be addressed with the existing Working Group which has only few members. Most severe is the lack of a senior scientist who is professional in gut immunology (or at least medical immunology). The early recruitment of such a person is urgently needed, and even with such a person in place there will remain a need for considerable collaboration with visiting and outside immunologists. At least one clinical investigator or physician with a full-time research interest in HD projects is also urgently needed. Dr Ahmed, recently returned from a training period in Australia, should be encouraged to take up research on the top priority projects of human gut immunology where the Centre has a much stronger possibility to be first-rate than in basic cellular immunology. Attempts should be made to attract scientists and physicians from other Working Groups to become associate members of the HDWG and participate in protocols to improve the current scientific staff deficiency situation. With regard to research support staff it is competent in most of the methods recently used in the HD programme laboratories.

Some new equipment is needed to strengthen Host Defence:

1 -70° Deep-freeze

1 Mini computer ("Osborne")

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1 water bath

1 microbalance

Gel filtration and lyophilization equipment would also be needed if not available elsewhere in the Centre.

The need for electron microscopy facilities are probably greater for DTWG and PTWG than for HDWG. The Board felt that any funds for establishing electron microscopy facilities should be sought as a "total package" and be kept separate from individual programme budgets.

(g) Project Development Committee (PDC)

The initial function served by the PDC of collecting projects not under any single programme and coordinating across programmes was acknowledged. It was agreed that many of the projects currently listed under this Committee should be turned over to the appropriate Programmes since they were sufficiently matured. However, the relevant Programme had to have the required expertise and motivation to successfully attend to the requirements of each assigned project for this to succeed.

Specific comments on the projects presented were as follows:-

(1) The MCH-FP Sirajganj, Noapara, Matlab, Teknaf and Munshiganj project should be under the CSRWG as soon as adequate expertise is recruited in the area of health services research.

(2) The community initiative cluster of projects could form an interesting subject of a National Workshop. This could help develop these ideas further.

(3) The embankment project is large and could distort the overall focus of the Centre. However since it will inevitably affect the DSS in Matlab it must be considered. Overall responsibility

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for this large project could be outside the Centre in an appropriate National institution.

(4) Cereal-based ORS should go to the Nutrition Programme, as should the Diarrhoeal Growth monograph.

There was enthusiasm for the project to be taken up with National institutions. It was recommended that the Centre pursue vigorously the link with BMRC to establish a research cell for the training of National scientists.

The implications of projects outside of Bangladesh were considered. It was agreed that there was merit in those projects which emphasized research training of scientists in other developing countries. It was noted, however, that such projects could only proceed if funds and staff were available to address the needs. Policy guidelines have been suggested by the Board (pp. 5-6 these minutes) with specific reference to good coordination with the WHO/CDD programme. There was a discussion of the distinction between "core" versus "generally ear-marked" funds. At present the Centre does not distinguish those funds noted as "generally ear-marked" from those to the "core". Project funds are clearly in a separate category.

(h) Programme Coordination Committee

The work of the organizing body of the Ordinance-mandated Programme Coordination Committee was presented by Dr M.A. Matin. The composition and proposed by-laws were reviewed. It was agreed that the overall committee should be an open one with as many members as were interested. There was a suggestion that there might be some ceiling set on membership but during initial stages it was felt open encouragement to scientists and institutions to participate was desirable. The small Standing Committee would serve to efficiently manage the affairs of the larger Committee.

The following resolutions were passed:

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RESOLUTION 11/DEC. 82

The Programme Coordination Committee of the following composition be established:

Ex-officio members -

1. Vice Chancellor, Bangladesh Agricultural University
2. President, BIRDEM
3. Director, Institute of Nutrition and Food Science
4. Chairman, BARC
5. Director, NIPSOM
6. Director, BFRP
7. Executive Director, Bangladesh Rural Advancement Committee
8. Chairman, BCSIR
9. Director, Institute of Public Health
10. Vice Chancellor, Dhaka University
11. Director
12. Director, MIS
13. Director, IPGM&R
14. Director, Shishu Hospital
15. Director, Children's Nutrition Unit (Save the Children Fund)
16. Director, IPHN
17. Principal, Paramedical Institute
18. Chairman, BIDS
19. Project Director, National Oral Rehydration Project
20. Director, IBS, Rajshahi
21. Director, BMRC
22. Representatives from the Board of Trustees and Director, Programme Heads, including Associate Director, Training and Extension of ICDDDR,B.

Individual Members -

1. Dr (Brig) M.R. Chowdhury, AFIP&T
2. Dr Hajera Mahtab, BIRDEM
3. Dr Farida Huq, IPH
4. Dr Ghyasuddin Ahmed, NIPSOM
5. Dr Anwarul Azim Chowdhury, Microbiology Dept., Dhaka University

Further individuals may be co-opted at the discretion of the Programme

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Coordination Committee.

An 11-member Standing Committee is recommended as follows:-

1. Dr Kamaluddin Ahmed, INFS
2. Mrs Gole Afroz Mahbub, MIS
3. Dr A.K. Khan, BMRC
4. Director, NORP
5. Dr A.K.M. Aminul Haque, BAU, Mymensingh
6. Dr (Brig) M.R. Chowdhury, AFIP&T
7. Director, ICDDR,B
8. Dr M.A. Matin (Trustee member)
9. Dr K.M.S. Aziz, ICDDR,B (Chairman, RRC)

10 & 11 Government nominations

RESOLUTION 12/DEC. 84

The Board approves the following By-laws of the Programme Coordination Committee (PCC):

(1) There would be a bigger body to be named as a PCC to meet at least twice a year and a smaller body, a Standing Committee which shall meet at least once a quarter of the year.

(2) The heads of organizations engaged in research in the relevant fields would be members of the PCC. Membership of the Committee may be in the individual capacity of ex-officio. A head of an organization can permanently nominate a suitable senior person from that institution to become a member of PCC. Individual members shall be appointed for three years.

(3) The Standing Committee with representatives of the Government would be formed by the Board of Trustees on recommendation of the PCC. There would be 11 members in the Standing Committee inclusive of 2 representatives of the Government.

(4) A running inventory of the work done in this field (diarrhoeal diseases and related subjects) and of workers in Bangladesh would be prepared by the Standing Committee and presented to the PCC.

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(5) The PCC shall identify overlaps between the work of the Centre and other organizations in the field of diarrhoeal diseases and related subjects.

(6) The PCC shall discuss and offer to mediate any inter-institutional controversy regarding undesirable overlaps and competition in diarrhoeal diseases and related subjects.

(7) The PCC shall be supportive on request of national institutions in preparation of research protocols, training and in securing funds for approved research protocols, in addition to providing Centre's facilities for carrying out research as feasible. (Protocols approved by PCC or its Standing Committee.) The Standing Committee will be responsible for scrutinising such protocols either by itself or by any other suitable committee(s).

(8) The Research Review Committee of ICDDR,B on approval of ICDDR,B protocols shall forward the approved protocol to PCC, so that the Committee can identify and report to the Board actions prejudicial to the interest of research in similar fields carried out by other organizations in Bangladesh.

(9) The nominated members from the Government to the Standing Committee will also be members of the PCC.

(10) At least 1/3 members of the Committee (Standing and PCC) will form a quorum for the meeting. There would be 15 days notice for PCC and 7 days notice for Standing Committee.

(11) The Standing Committee will nominate one of its members to ICDDR,B, namely Research Review Committee and Ethical Review Committee, for better coordination between these 3 Committees.

RESOLUTION 13/DEC. 82

In compliance with the provision of Section 12, Sub-section 3, of the Ordinance the following resolutions are adopted:

(a) External Scientific Review will be carried out in the first quarter of every alternate year.

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(b) In view of the fact that the last external review was convened during 1982, the next such review will be completed during the first quarter of 1984.

(c) Selection of personnel for external review must be finalised in the mid year Board meeting of the year immediately preceding the year of commencement of the review.

(d) The report of the reviewers with comments of the Director on the report will be placed before the Board meeting immediately following the review.

Agenda 8: Approval of Budget, FY 1983

On the basis of the Programme Review first by the External Reviewers then by the Trustees, the 1983 Budget was considered. The overwhelming immediate concern was to insure that funds were present for the recruitment of scientific leadership in 1983. Most of the discussion then focussed on this issue. It was noted that there were eight (8) international level positions for recruitment in 1983. This was sufficient to achieve the desired result. The details of recruitment are contained in the Personnel and Selection Committee report (Doc. IO/BT/Dec. 82). After further intense probing of expected income a budgetary ceiling of 6.5 million dollars was agreed to. Internal shifts, to achieve the necessary programme changes for implementing reviewers suggestions, were left to the judgement of the Director.

To avoid further over-commitments it was agreed that new projects outside of the budget ceiling could only be started after funds were received.

The budget for the next External Review as mandated by the Ordinance should be in 1984. The present review process was completed in 1982 thus the next mandated two year review would be in 1984.

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The following resolutions were passed:

RESOLUTION 14/DEC. 82 The Board approves the budget ceiling of $6.5 million for FY 1983. The amount of $600,000 budgeted for expected increases in local WHO scales can only be utilised to meet such salary increases. Any amounts remaining from this provision cannot be expended for any other purposes, except with prior approval of the Board.

RESOLUTION 15/DEC. 82 The Board authorises the Director to proceed with fully funded projects which have not been included in the budget of $6.5 million, provided that he obtains prior approval from the Chairman of the Board.

Agenda 9: Report of the Ad Hoc Search Committee

The position of Director of the Centre for a period of three years commencing from July 1985 will be advertised in January 1983 giving necessary particulars including the order of emoluments etc. Besides, the Board members are invited to send names of probable candidates including those from the existing personnel working in the Centre. All these names will be screened by a Selection Committee consisting of Drs Bradley, Matin, Holmgren and Mata and a panel of about ten names will be placed before the Board in its meeting in June 1983.

The following resolution was passed:

RESOLUTION 16/DEC. 82 The Board is pleased to re-appoint Dr W.B. Greenough as Director of the Centre.

In view of the tenure limitation of a Director to a total period of six years provided in Section 13(1) of the Ordinance, this re-appointment will be for a period of two years commencing from 1 July, 1983.

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Agenda 10: Report of the Personnel and Selection Committee

The report of the Personnel and Selection Committee (Doc. 10/BT/Dec. 82) was presented by Dr M.A. Matin. The suggested resolutions were reviewed. It was agreed that the Centre should follow the WHO rule of 6 dependents allowance but all Trustees registered a strong regret that this rule encourages a large family in the context of the Centre's and Bangladesh's efforts to encourage small families. It is hoped that the WHO would change this rule to be consonant with the goal of health for all by the year 2000, since a policy of a family size of six if pursued would lead to a health disaster by the year 2000 or before.

There was discussion of the definition of international level. At present this has been defined by the Board as P4 or above. Dr F. Assaad was asked to inquire of WHO and inquire concerning their definition and whether the whole P scale should ultimately come under the "international level". Should this occur the Board would be required to appoint all staff entering any P graded position. At present the P level positions and those in the Extended Levels are appointed by the Director and reported to the Personnel and Selection Committee. For all positions below P4 it has been suggested that the Personnel and Selection Committee should finally appoint these. Further study is needed on this matter and on the best means for staff evaluation.

It was agreed that the next meeting of the Personnel and Selection Committee, including Drs. M.A. Matin, J. Sulianti Saroso, F. Assaad and W.B. Greenough III, should be in Geneva on Thursday, 10 March, 1983.

The following resolutions were passed:

RESOLUTION 17/DEC. 82 — All resolutions passed by the Board in previous years which are inconsistent with the WHO Rules and Regulations cease to apply with effect from January 1, 1983, unless specified thereafter.

RESOLUTION 18/DEC. 82 — In pursuance of clause 14(1) and (2) of the Ordinance the Board

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approves that the WHO Rules and Regulations as far as the same are applicable to ICDDR,B be adopted except where it is in direct conflict with the Centre's Ordinance. Where the WHO Rules and Regulations are in direct conflict with the Ordinance, the provisions in the Ordinance will override the WHO Rules affected.

RESOLUTION 19/DEC. 82

Where the administrative machinery differs and where it is impossible for the Centre to adopt such procedures, the Centre will adopt its own administrative procedures in the application of WHO Rules. The following are such deviations:

Section 12 on Appeals

Rule 1210.1	reworded where necessary
1210.2	" " "
1220.2	" " "
1220.3	" " "
1230.2	" " "
1230.3.1	" " "
1230.3.2	" " "
1230.3.3	deleted
1230.4	"
1230.5	"
1230.6	becomes ICDDR,B Rule 1230.4
1230.7	" " " 1230.5 and reworded
1230.8	" " " 1230.6 " "
1230.9	deleted
1240	reworded as necessary
1240.1	deleted
1240.2	"
1245	"
1250	reworded as necessary

RESOLUTION 20/DEC. 82

The Board recognises that the Ordinance under clause 14(1) and (2) only provides for Bangladeshi international staff and local general

services categories for their conversion to the WHO salaries and benefits scheme. The Board resolves that since the Centre has staf in levels 7 and 8, the Centre adopts the WHO extended level scales to fit such staff. Such extended level scales are existent in some WHO offices outside Bangladesh.

RESOLUTION 21/DEC. 82

In recognition of clause 14(1) of the Ordinance the Board approves the departure from WHO Rules and Regulations, and allows the Education Grant to be enjoyed by both expatriate and local incumbents in international level positions.

RESOLUTION 22/DEC. 82

The Board further approves that effective 1 January, 1983 all staff in General Services Categories, Levels 7 and 8 and international level staff be put on full WHO payscales and benefits. All previous benefits in cash or kind not conforming to the WHO scales and benefits shall be withdrawn except the education grant for local international level staff and the severance pay and provident fund which will remain until an improved scheme called the pension plan or similar can be implemented. The total amount of contribution to the severance pa and provident fund shall not exceed the combined total of both contributions of staff and Centre which under present staff rules are 7% and 14% respectively. In implementing full WHO payscales an benefits the previous resolutions restricting dependants to two children is withdrawn from 1 January, 1983 and that the Centre follow the dependants rule as provided by WHO.

RESOLUTION 23/DEC. 82

Resolutions 17 through 22/Dec. 82 indicate completion of the transition of the Centre from the former Cholera Research Laboratory to the current International Centre for Diarrhoeal Disease Research, Bangladesh. The provisions of Clause 30(b) of the Ordinance will cease to apply with this transition. The Board asks the Director to ensure that all staff conform to WHO staff rules and pay scales by 1 January, 1983 with a report to the Board.

RESOLUTION 24/DEC. 82

The Board instructs the Director to seek membership of the Centre in the UN Joint Staff Pension Fund in order to give the Centre's staff the opportunity to participate in the same or similar pension fund as WHO. The Director is to report on this at the next Board meeting.

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RESOLUTION 25/DEC. 82

The Board authorises the establishment of the following at P1 positions:

(a) 3 scientific positions including one for Library Sciences;

(b) 3 administrative positions including those of the Computer Manager, Finance Controller and Supply Officer.

As and when such positions are budgeted and when funds permit candidates will be appointed into these positions accordingly.

RESOLUTION 26/DEC. 82

The Director is authorised to proceed with the recruitment of the following international staff:

Dr Selwyn Baker

Dr Ivan Ciznar

Dr Bogdan Wojtyniak

RESOLUTION 27/DEC. 82

The following international level staff are reappointed from 1 July, 1983 for the following periods and levels:

Dr M.M. Rahaman	Senior Scientist	3 yrs fr 1.7.83 to 30.6.86
Dr M.I. Huq	Scientist	3 yrs fr 1.7.83 to 30.6.86
Dr M.U. Khan	Scientist	3 yrs fr 1.7.83 to 30.6.86
Dr A.M. Molla	Scientist	3 yrs fr 1.7.83 to 30.6.86
Dr A.K.M.A. Chowdhury	Scientist	2 yrs fr 1.7.83 to 30.6.85

Since these are reappointments there will be no special increase in steps or level except by action by the Board for all ranked at these levels.

RESOLUTION 28/DEC. 82

The reports of the Finance Committee and Personnel and Selection Committee are accepted by the Board.

Agenda 11: Varia

(1) It was agreed that the next Board Meeting would be in New York City, USA on Monday, Tuesday and if required Wednesday, June 13-15, 1983. The International Conference on Oral Rehydration Therapy, Washington, D.C. will involve some Trustees and staff of the Centre the week before June 6-10, 1983. The Consultative

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Group Meeting will be scheduled on Thursday, June 2 or Thursday, June 16, 1983 in New York. This will minimize travel costs to the Centre for these meetings as USAID is expected to provide support for those attending the ICORT Meeting.

(2) In recognition of Professor Donald Mackay's contribution to the health of workers on the tea gardens of Bangladesh, the Centre may provide the facility for receiving and accounting for contributions in his memory. A copy of the Memorial Fund document is available (Doc. 11/BT/Dec. 82).

The following resolution was passed:

RESOLUTION 29/DEC. 82 The Board approves the setting up of the Donald Mackay Memorial Fund. The Director is instructed to open a Bank account in the name of Donald Mackay Memorial Fund. All donations and proceeds received for this fund will be deposited into this account. The Board further authorises the Director to receive such donations on behalf of the Fund and that the Director and Associate Director, Administration & Finance be the authorised cheque signatories for operation of this account.

RESOLUTIONS

BOARD OF TRUSTEES MEETING

6-8 DECEMBER, 1982

RESOLUTIONS

BOARD OF TRUSTEES MEETING

6-8 DECEMBER, 1982

RESOLUTION 1/DEC. 82

RESOLVED: The Centre is encouraged to continue to pursue the matter of exemption from income tax for its Bangladeshi staff. It was noted that this is consistent with the policy of the Government of Bangladesh not to tax the Bangladeshi staff of UN agencies in Bangladesh.

RESOLUTION 2/DEC. 82

RESOLVED: The Board expresses its appreciation of the work of the external reviewers, and has incorporated their numerous important comments into its own review of the programme and budget for 1983 and beyond.

RESOLUTION 3/DEC. 82

RESOLVED: The Board approves convening a Consultative Group meeting in New York in June 1983 in conjunction with the UNDP Governing Council meeting.

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RESOLUTION 4/DEC. 82

RESOLVED: When the total donor support for FY 1982 of $6.48 million is reached and received by January/February 1983, it is expected that a credit balance of $914,000 will be available in FY 1983. The Board therefore instructs the Director to set aside $700,000 to start off the "Reserve Fund" and to prepare regulations for its operation to be reviewed by the Finance Committee and reported to the Board at its meeting in June 1983.

RESOLUTION 5/DEC. 82

RESOLVED: The Board requests the Director to further pursue the possibility of attracting matching funds from interested donors against the Reserve Fund account.

RESOLUTION 6/DEC. 82

RESOLVED: The Board recognises the necessity of temporary cash shortfalls resultant from differences in timing of receipts of donor support against operating expenditure. The Board authorises the Director to negotiate bridging facilities in the form of bank overdraft up to a maximum equivalent of US Dollars one million. Since the American Express International Banking Corporation, Dhaka, has approved an overdraft facility in Taka of up to Taka 7.0 million, the Board authorises the Director to finalise this overdraft arrangement.

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RESOLUTION 7/DEC. 82

RESOLVED: The Board further authorises the Director, if it is absolutely necessary and required by the Bank, to pledge and charge the assets of the Centre to the Bank as collateral for this total overdraft facility of $1.0 million.

RESOLUTION 8/DEC. 82

RESOLVED: Since cash shortfalls need to be minimised, the Board instructs the Director that no projects above the budget ceiling set will be allowed to commence until pledged funds for the project are received. Until such time as the donor has demonstrated its interest in the project by mobilising the required funds, the programme head or scientist responsible will not be allowed to start the project.

RESOLUTION 9/DEC. 82

RESOLVED: To protect the Severance Pay account from further erosion in real terms, and also to earn interest to make up the current shortfall in this account, the Board instructs the Director to pursue the possibility of converting the severance pay account into US Dollars and place this in time deposits. Pursuant to Clause 17(2) of the Ordinance, the Board requests the Director to take this matter up with the nationalised banks in Bangladesh. This resolution supercedes Resolution 24/June 82 and any other previous resolutions in this regard.

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RESOLUTION 10/DEC. 82

RESOLVED: The Board authorises the Director to negotiate terms and conditions and enter into an agreement with the appropriate authorities for the release of the UNROB funds.

RESOLUTION 11/DEC. 82

RESOLVED: The Programme Coordination Committee of the following composition be established:

Ex-officio members -

1. Vice Chancellor, Bangladesh Agricultural University
2. President, BIRDEM
3. Director, Institute of Nutrition and Food Science
4. Chairman, BARC
5. Director, NIPSOM
6. Director, BFRP
7. Executive Director, Bangladesh Rural Advancement Committee
8. Chairman, BCSIR
9. Director, Institute of Public Health
10. Vice Chancellor, Dhaka University
11. Director-General, NIPORT
12. Director, MIS
13. Director, IPGM&R
14. Director, Shishu Hospital
15. Director, Children's Nutrition Unit (Save the Children Fund)
16. Director, IPHN
17. Principal, Paramedical Institute
18. Chairman, BIDS
19. Project Director, National Oral Rehydration Project
20. Director, IBS, Rajshahi
21. Director, BMRC

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22. Representatives from the Board of Trustees and Director, Programme Heads, including Associate Director, Training and Extension of ICDDR,B.

Individual Members -

1. Dr (Brig) M.R. Chowdhury, CMH
2. Dr Hajera Mahtab, BIRDEM
3. Dr Farida Huq, IPH
4. Dr Ghyasuddin Ahmed, NIPSOM
5. Dr Anwarul Azim Chowdhury, Microbiology Dept., Dhaka University

Further individuals may be co-opted at the discretion of the Programme Coordination Committee.

An 11-member Standing Committee is recommended as follows:-

1. Dr Kamaluddin Ahmed, INFS
2. Mrs Golc Afroz Mahbub, MIS
3. Dr A.K. Khan, BMRC
4. Director, NORP
5. Dr A.K.M. Aminul Haque, BAU, Mymensingh
6. Dr (Brig) M.R. Chowdhury, AFIP&T
7. Director, ICDDR,B
8. Dr M.A. Matin (Trustee member)
9. Dr K.M.S. Aziz, ICDDR,B (Chairman, RRC)

10 & 11 Government Nominations

RESOLUTION 12/DEC. 82

RESOLVED: The Board approves the following By-laws of the Programme Coordination Committee (PCC):

(1) There would be a bigger body to be named as a PCC to meet at least twice a year and a smaller body, a Standing Committee which shall meet at least once a quarter of the year.

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(2) The heads of organizations engaged in research in the relevant fields would be members of the PCC. Membership of the Committee may be in the individual capacity or ex-officio. A head of an organization can permanently nominate a suitable senior person from that institution to become a member of PCC. Individual members shall be appointed for three years.

(3) The Standing Committee with representatives of the Government would be formed by the Board of Trustees on recommendation of the PCC. There would be 11 members in the Standing Committee inclusive of 2 representative of the Government.

(4) A running inventory of the work done in this field (diarrhoeal diseases and related subjects) and of workers in Bangladesh would be prepared by the Standing Committee and presented to the PCC.

(5) The PCC shall identify overlaps between the work of the Centre and other organizations in the field of diarrhoeal diseases and related subjects.

(6) The PCC shall discuss and offer to mediate any inter-institutional controversy regarding undesirable overlaps and competition in diarrhoeal diseases and related subjects.

(7) The PCC shall be supportive on request of national institutions in preparation of research protocols, training and in securing funds for approved research protocols, in addition to providing Centre's facilities for carrying out research as feasible. (Protocols approved by PCC or its Standing Committee.) The Standing Committee will be responsible for

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scrutinising such protocols either by itself or by any other suitable committee(s).

(8) The Research Review Committee of ICDDR,B on approval of ICDDR,B protocols shall forward the approved protocol to PCC, so that the Committee can identify and report to the Board actions prejudicial to the interest of research in similar fields carried out by other organizations in Bangladesh.

(9) The nominated members from the Government to the Standing Committee will also be members of the PCC.

(10) At least 1/3 members of the Committee (Standing and PCC) will form a quorum for the meeting. There would be 15 days notice for PCC and 7 days notice for Standing Committee.

(11) The Standing Committee will nominate one of its members to ICDDR,B, namely Research Review Committee and Ethical Review Committee, for better coordination between these 3 Committees.

RESOLUTION 13/DEC. 82

RESOLVED: In compliance with the provision of Section 12, Sub-section 3, of the Ordinance the following resolutions are adopted:

(a) External Scientific Review will be carried out in the first quarter of every alternate year.

(b) In view of the fact that the last external review was convened during 1982, the next such review will be completed during the first quarter of 1984

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(c) Selection of personnel for external review must be finalised in the mid year Board meeting of the year immediately preceding the year of commencement of the review.

(d) The report of the reviewers with comments of the Director on the report will be placed before the Board meeting immediately following the review.

RESOLUTION 14/DEC. 82

RESOLVED: The Board approves the budget ceiling of $6.5 million for FY 1983. The amount of $600,000 budgeted for expected increases in local WHO scales can only be utilised to meet such salary increases. Any amounts remaining from this provision cannot be expended for any other purposes, except with prior approval of the Board.

RESOLUTION 15/DEC. 82

RESOLVED: The Board authorises the Director to proceed with fully funded projects which have not been included in the budget of $6.5 million, provided that he obtains prior approval from the Chairman of the Board.

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RESOLUTION 16/DEC. 82

RESOLVED: The Board is pleased to re-appoint Dr W.B. Greenough as Director of the Centre.

In view of the tenure limitation of a Director to a total period of six years provided in Section 13(1) of the Ordinance, this re-appointment will be for a period of two years commencing from 1 July, 1983.

RESOLUTION 17/DEC. 82

RESOLVED: All resolutions passed by the Board in previous years which are inconsistent with the WHO Rules and Regulations cease to apply with effect from January 1, 1983, unless specified thereafter.

RESOLUTION 18/DEC. 82

RESOLVED: In pursuance of clause 14(1) and (2) of the Ordinance the Board approves that the WHO Rules and Regulations as far as the same are applicable to ICDDR,B be adopted except where it is in direct conflict with the Centre's Ordinance. Where the WHO Rules and Regulations are in direct conflict with the Ordinance, the provisions in the Ordinance will override the WHO Rules affected.

../10.

RESOLUTION 19/DEC. 82

RESOLVED: Where the administrative machinery differs and where it is impossible for the Centre to adopt such procedures, the Centre will adopt its own administrative procedures in the application of WHO Rules. The following are such deviations:

Section 12 on Appeals

Rule	1210.1	reworded where necessary
	1210.2	" " "
	1220.2	" " "
	1220.3	" " "
	1230.2	" " "
	1230.3.1	" " "
	1230.3.2	" " "
	1230.3.3	deleted
	1230.4	"
	1230.5	"
	1230.6	becomes ICDDR,B Rule 1230.4
	1230.7	" " " 1230.5 and reworded
	1230.8	" " " 1230.6 " "
	1230.9	deleted
	1240	reworded as necessary
	1240.1	deleted
	1240.2	"
	1245	"
	1250	reworded as necessary

../11.

RESOLUTION 20/DEC. 82

RESOLVED: The Board recognises that the Ordinance under clause 14(1) and (2) only provides for Bangladeshi international staff and local general services categories for their conversion to the WHO salaries and benefits scheme. The Board resolves that since the Centre has staff in levels 7 and 8, the Centre adopts the WHO extended level scales to fit such staff. Such extended level scales are existent in some WHO offices outside Bangladesh.

RESOLUTION 21/DEC. 82

RESOLVED: In recognition of clause 14(1) of the Ordinance the Board approves the departure from WHO Rules and Regulations, and allows the Education Grant to be enjoyed by both expatriate and local incumbents in international level positions.

../12.

RESOLUTION 22/DEC. 82

RESOLVED: The Board further approves that effective 1 January, 1983 all staff in General Services Categories, Levels 7 and 8 and international level staff be put on full WHO payscales and benefits. All previous benefits in cash or kind not conforming to the WHO scales and benefits shall be withdrawn except the education grant for local international level staff and the severance pay and provident fund which will remain until an improved scheme called the pension plan or similar can be implemented. The total amount of contribution to the severance pay and provident fund shall not exceed the combined total of both contributions of staff and Centre which under present staff rules are 7% and 14% respectively. In implementing full WHO payscales and benefits the previous resolutions restricting dependants to two children is withdrawn from 1 January, 1983 and that the Centre follow the dependants rule as provided by WHO.

../13.

RESOLUTION 23/DEC. 82

RESOLVED: Resolutions 17 through 22/Dec. 82 indicate completion of transition of the Centre from the former Cholera Research Laboratory to the current International Centre for Diarrhoeal Disease Research, Bangladesh. The provisions of Clause 30(b) of the Ordinance will cease to apply with this transition. The Board asks the Director to ensure that all staff conform to WHO staff rules and pay scales by 1 January, 1983 with a report to the Board.

RESOLUTION 24/DEC. 82

RESOLVED: The Board instructs the Director to seek membership of the Centre in the UN Joint Staff Pension Fund in order to give the Centre's staff the opportunity to participate in the same or similar pension fund as WHO. The Director is to report on this at the next Board meeting.

RESOLUTION 25/DEC. 82

RESOLVED: The Board authorises the establishment of the following to P1 positions:

(a) 3 scientific positions including one for Library Sciences;

(b) 3 administrative positions including those of the Computer Manager, Finance Controller and Supply Officer.

As and when such positions are budgeted and when funds permit candidates will be appointed into these positions accordingly.

../14.

RESOLUTION 26/DEC. 82

RESOLVED: The Director is authorised to proceed with the recruitment of the following international staff:

Dr Selwyn Baker

Dr Ivan Ciznar

Dr Bogdan Wojtyniak

RESOLUTION 27/DEC. 82

RESOLVED: The following international level staff are re-appointed from 1 July, 1983 for the following periods and levels:

Dr M.M. Rahaman	Senior Scientist	3 yrs fr 1.7.83 to 30.6.86
Dr M.I. Huq	Scientist	3 yrs fr 1.7.83 to 30.6.86
Dr M.U. Khan	Scientist	3 yrs fr 1.7.83 to 30.6.86
Dr A.M. Molla	Scientist	3 yrs fr 1.7.83 to 30.6.86
Dr A.K.M.A. Chowdhury	Scientist	2 yrs fr 1.7.83 to 30.6.85

Since these are reappointments there will be no special increase in steps or level except by action by the Board for all ranked at these levels.

RESOLUTION 28/DEC. 82

RESOLVED: The reports of the Finance Committee and Personnel and Selection Committee are accepted by the Board.

../15.

RESOLUTION 29/DEC. 82

RESOLVED: The Board approves the setting up of the Donald Mackay Memorial Fund. The Director is instructed to open a Bank account in the name of Donald Mackay Memorial Fund. All donations and proceeds received for this fund will be deposited into this account. The Board further authorises the Director to receive such donations on behalf of the Fund and that the Director and Associate Director, Administration & Finance be the authorised cheque signatories for operation of this account.

MATTERS ARISING
- DISEASE TRANSMISSION REPORT

INTERNATIONAL CENTRE FOR
DIARRHOEAL DISEASE
RESEARCH, BANGLADESH

Memorandum

TO : Board of Trustees, ICDDR,B

FROM : Director

DATE : 23.5.83

SUBJECT : FORMULATION OF DISEASE TRANSMISSION PROGRAMME

I am responding to the following request by the Board at their December 1982 meeting:-

"The new programme for the Disease Transmission Programme should be presented to the Board by June 1983."

The following senior epidemiologists and microbiologists were contacted -

Dr Eugene Gangarosa
Dr Dhiman Barua
Dr Robert E. Black

A plan was established for Drs Barua and Gangarosa to jointly assist us in formulating the Disease Transmission Programme in April. Unfortunately Dr Gangarosa broke his leg and Dr Barua felt it unwise to do a partial job. Dr Black could not be quickly available to fill in for Dr Gangarosa. Accordingly, we have gone ... back to a prior detailed review by Dr James Hughes of CDC done in 1981 and re-examined the current and future plans and priorities.

... Dr A.R. Samadi has submitted the attached working paper for the information and suggestions of the Board members. In support of the serious efforts of Dr Samadi and his group I would say that the review of the Disease Transmission area was less complete than most other Programmes. The rapid response to shift priorities to take advantage of the unique situation with respect to cholera in Bangladesh and the world speaks well for this ... Programme's function. I attach 3 important papers

../2.

accomplished since the last Board meeting.

1. Samadi Lancet Cholera
2. Shahid submitted BMJ
3. Huq JDDR in press

We intend to pursue further consultation as requested and shall welcome suggestions in this respect as to available and effective experts in the field of diarrhoeal illness epidemiology.

WBG:jc

Report on Consultation with Disease Transmission Working Group

International Centre for Diarrhoeal Disease Research, Bangladesh

January 7-23, 1981

James M. Hughes, M.D., Chief

Water-Related Diseases Activity

Enteric Diseases Branch

Bacterial Diseases Division

Center for Infectious Diseases

Centers for Disease Control

Atlanta, Georgia 30333

For priority areas and study designs please refer to Table 4.

February 12, 1981

Objectives

1. Review and summarize studies which have been conducted at CRL/ICDDR,B and focused on mode of transmission of enteric pathogens.

2. Review and summarize results of studies conducted in Bangladesh which have attempted to assess the impact of water quality, water availability, and/or excreta disposal facilities on indicators of diarrheal disease.

3. Develop a list of studies focusing on mode of transmission of selected enteric pathogens which might be undertaken by members of the Disease Transmission Working Group.

4. Develop a list of potential interventions in water supply and sanitation which might be evaluated for their impact on diarrheal disease transmission.

Methods

Lists of publications by members of the CRL/ICDDR,B staff between 1960 and November, 1980, were reviewed to identify papers, abstracts, Working Papers, Scientific Reports, and Special Publications which may have focused on aspects of transmission of enteric pathogens. Details of study design and findings regarding modes of transmission were summarized. Reports containing data on the descriptive epidemiology of enteric pathogens were also reviewed and data on peak age-specific incidence rates and seasonality were summarized.

Prior to developing a list of potential areas for future research and possible interventions whose impact could be evaluated, conversations were held with members of the Disease Transmission Working Group to learn of their interest and suggestions regarding potential interventions. Draft summaries

of epidemiologic characteristics of enteric pathogens and results of studies on modes of transmission were shared with members of the Working Group who made a number of valuable comments and suggestions which have been incorporated into this final report.

Results

Data on the peak incidence, age group and peak season for enteric pathogens studied at CRL/ICDDR,B are summarized in Table 1. The agents are divided into a group of known enteric pathogens and a second group of potential enteric pathogens. Results of studies which have focused on mode of transmission of enteric pathogens are summarized in Table 2. With the exception of both classical and El Tor V. cholerae and Shigella, data on transmission are limited. For classical V. cholerae, studies indicate that use of tubewell water for drinking does not appear to be protective and that the use of canal and possibly river water for drinking and bathing may be important in transmission. For El Tor V. cholerae, use of tubewell water for drinking also does not appear to be protective, use of surface water for other purposes, (especially cooking and bathing) appears to play some role in transmission, and contamination of water seems to occur more frequently at the source than in the home. One study also indicated that eating meals outside the home may be important in transmission of El Tor V. cholerae. For Shigella, use of tubewell water for drinking again does not appear to be protective. Use of surface water for drinking has been identified as a risk factor in some but not all studies, the volume of water used per person per day appears to be inversely related to risk of developing shigellosis, and the use of soap for washing dramatically reduces Shigella transmission in families in Dacca, suggesting that improved personal hygiene may result in decreased transmission of this agent by the fecal-oral route.

TABLE 1

EPIDEMIOLOGIC CHARACTERISTICS OF ENTERIC INFECTIONS
AT CRL/ICDDR,B

Agents	Peak Incidence	Peak Season
Known Pathogens		
V. cholerae (El Tor)	2-4 yrs	Sept-Nov (Mar-May)
MAR *V. cholerae*	Mean 15 yrs	Sept-Jan
V. cholerae (classical)	2-4 yrs	Nov-Jan (Mar-May)
Non O-1 *V. cholerae* (NAG)	≤4 yrs	Mar-June (Oct-Nov)
V. parahaemolyticus	?	?
EF - 6 (Group F vibrios)	≤4 yrs	Oct-May
Enterotoxigenic *E. coli*	6 mos-3 yrs	Mar-Sept
Shigella	≤4 yrs	Aug-Dec; (June-Aug in Matlab and Teknaf)
Salmonella (non-typhi)	Median 12 yrs	Jun-Aug
Salmonella typhi	?	?
Campylobacter fetus ssp *jejuni**+	≤4 yrs	?
*Yersinia enterocolitica***	?	?
Rotavirus	≤24 mos	Sept-Dec(Apr-June)
27 nm agents	≤4 yrs	?
Giardia lamblia+	2-3 yrs	?
Entamoeba histolytica	?	?
Potential Pathogens		
Aeromonas hydrophila	?	?
Plesiomonas shigelloides	?	?
adenovirus	?	?
astrovirus	?	?
calicivirus	?	?
coronavirus	?	?

*etiologic significance in Bangladesh uncertain
+studies focusing on descriptive epidemiology of these agents in progress
**initial studies indicate that this agent may be infrequently associated with diarrhea in Bangladesh

Seven controlled studies comparing rates for diarrheal disease indicators in people exposed to different levels of water quality, water availability, and/or excreta disposal facilities have been conducted in Bangladesh (Table 3). Results of these studies have not been consistent but have suggested that using tubewell water for drinking does not consistently result in a decreased incidence of diarrhea or cholera.

Recommendations

Studies conducted by members of the Disease Transmission Working Group should attempt to identify modes of transmission of specific enteric pathogens so that appropriate interventions with the potential to interrupt transmission can be identified, implemented, and then evaluated for their impact on morbidity due to specific agents and to diarrheal disease in general.

After completion of this review, a number of issues concerning transmission of enteric pathogens were identified which seem worthy of future study (Table 4). The priority of the issue is indicated, potential study designs which could be used to address the issue are briefly summarized and the need for additional laboratory techniques to support such studies is indicated. Finally, a number of potential interventions in the water and sanitation sector were identified (Table 5); a priority for each study is assigned and a possible study design is indicated.

Acknowledgment

I am grateful to Dr. A.R. Samadi and the members of the Disease Transmission Working Group for their assistance and suggestions and to Ms. S. Chowdhury for assistance in the preparation of a preliminary draft of this material.

TABLE 2
RESULTS OF STUDIES OF TRANSMISSION OF ENTERIC PATHOGENS*, CRL/ICDDR,B

Pathogen	Reference	Area	Population	Study Design	Results/Conclusions
V. cholerae (El Tor)	Sommer[1]	Matlab	Field	Home visits for culture and serology (1969-1970)	Cholera infection rates similar in children living close to and further from tubewells.
	Curlin[2]	Matlab	Field	Family studies (1974)	Source of water for drinking, cooking, bathing, and washing a risk factor for cholera infection, but type of source and exposure not specified.
	Hughes[3]	Matlab	Field	Family studies (1/74 - 2/74)	Increased risk of infection in families associated with use of culture-positive sources for drinking, cooking, bathing or washing and same source used by index family for drinking, cooking, or bathing; increased risk of infection for individuals associated with using water from culture-positive sources for cooking ($p<.01$), bathing ($p<.01$) or washing ($p<.01$) and with using same source used by index family for bathing ($p<.05$).
	Khan[4]	Dacca	Inpt/Outpt Cases	Case-control (1974-1975)	No difference between cases and controls stratified by socio-economic status in frequency of use of tap/tubewell versus surface water source for drinking or bathing or sanitary versus open latrine; cases in all age groups more likely to have eaten outside the house during the previous 5 days ($p<.05$-$<.001$); high risk exposures were roadside hawkers ($p<.05$) houses of families with diarrhea ($p<.01$) and charitable meals ($p<.001$).
	Khan[4]	Dacca	Refugee Camps	Surveillance in camps (1974-1975)	Cholera rates in camps with taps, tubewells and sanitary latrines lower than in two camps with both taps/tubewells and tanks as well as only open latrines ($p<.01$ and $<.001$)
	Khan[4]	Dacca	Outpt/Outpt Index (Cases)	Tetracycline to family contacts and tablets for water disinfection; follow-up visit at 10 days (1975)	No difference in frequency of diarrhea in family contacts but hospitalization less frequent in intervention families ($p<.001$).
	Curlin[5]	Matlab	Inpt/Outpt	Record review; home visits for water use (1975)	In 2 of 6 two-month periods, cholera rates higher in tubewell users than non-users ($p<.05$ and $<.001$) but in one of the periods, an outbreak occurred in one village where >90% drank tubewell water.

Table 2 (cont)

Pathogen	Reference	Area	Population	Study Design	Results/Conclusions
V. cholerae (El Tor)	Spira[6]	Matlab	Field	Family studies and microbiologic surveillance (10/76-1/77)	Increased risk of infection in families when household water used for drinking or cooking was contaminated with V. cholerae ($p<.001$); contamination occurred most frequently at the source.
V. cholerae (classical)	Khan[7]	Dacca	Field	Outbreak investigation (1962)	In large single family outbreak, some cases may have resulted from ingestion of contaminated water.
	Khan[8]	Rayer Bazar	Field	Home visits (1965-1968)	Cholera case rates higher in areas near canal.
	Khan[9]	Rayer Bazar	Field	Culture of boatmen, community surveillance (1966)	Boatmen introduced infection to the community; transmission to community by canal water used for drinking or bathing.
	Sommer[1]	Matlab	Field	Home visits for culture and serology (1968-1969)	Cholera infection rates lower in children living close to tubewells than in those living further away ($p<.02$).
	Levine[10]	Matlab	Inpt/Outpt	Record review; observation and interview for water use (1964-1974)	Tubewell use not protective since tubewell users had higher cholera rates than non-users.
	Levine[11]	Matlab	Inpt/Outpt	Record review (1964-1974)	Cholera incidence higher in families using canal water than in families not using and living nearby (? significant) or living further from the hospital ($p<.001$).
	Khan[12]	Matlab	Inpt/Outpt	Record review, interview of 10% sample of households (1966-1975)	Families in high rate villages significantly more likely to drink and bathe in canal and river water and significantly less likely to drink and bathe in tank water; tubewell use for drinking similar; families with cholera more likely than those without cholera to drink and bathe in canals and rivers and less likely to drink and bathe in tanks (? significant).
Non O-1 V. cholerae	Khan[13]	Dacca	Inpt/Outpt, Field	Family studies (1977)	Water sources frequently positive (tanks, canals and rivers); infection rate higher (? significant) in families using water from mixed sources than for those using water only from closed sources.

Table 2 (cont)

Pathogen	Reference	Area	Population	Study Design	Results/Conclusions
S. flexneri	Khan[24]	Dacca	Field	Family studies (8-12/72)	Infection rate in household contacts higher in families using water from some surface sources (not significant); no difference for use of open versus closed latrine.
S. sonnei	Huq[25]	Dacca	Field	Outbreak investigation (2-5/76)	Vehicle may have been water from shallow tubewells.
Salmonella (non-typhi)	Blaser[26]	Dacca, Matlab	Inpt/Outpt	Clinical and microbiologic record review (1977-1979).	No association with type of water source; cases less likely to wash hands after defecation.
Campylobacter fetus ssp *jejuni*	Blaser[27]	Dacca, Matlab	Inpt/Outpt Field (DG study)	Stool cultures (2-3/79) Stool cultures (2-3/79)	Secondary spread uncommon; only 4% of households tested had multiple infections.

*No data for *S. typhi*, *C. fetus* ssp *jejuni*, *Y. enterocolitica*, *A. hydrophila*, *P. shigelloides*, rotavirus, 27 nm agents, other candidate viral gastroenteritis agents, *G. lamblia*, *E. histolytica*.

Table 2 (cont)

Pathogen	Reference	Area	Population	Study Design	Results/Conclusions
V. parahaemolyticus	Hughes[14]	Chandpur	Inpt/Outpt	Outbreak investigation (1975)	Vehicle of transmission probably hila and ruhi fish from Meghna (p=.10).
EF-6	Khan[13] Huq[15]	Dacca	Inpt/Outpt, Field	Family studies (10/76-6/77)	6% of water sources contaminated; only 1 secondary case identified.
ETEC	Black[16]	Matlab	Field	Family studies (10/77-5/78	Case family water sources more likely positive than control family sources; infection rate in household contacts higher in households with positive water or cooked food cultures; source positivity: ditches>tanks>canals>tubewells>rivers but differences not significant
Shigella species	Khan[17] Mosley[18]	Rayer Bazar	Outpt, Field	Stool cultures in clinic and home	Higher rates of shigellosis in areas where surface water sources were more frequently used (p<.05).
	Boyce[19]	Matlab	Field	Family studies (2-3/74)	Use of water from surface sources not a risk factor for infection.
	Curlin[5]	Matlab	Inpt/Outpt	Record review; home visits for water use (1975)	Shigellosis rates lower in tubewell users than non-users but difference not significant.
	Rahaman[20]	Teknaf	Field	Prospective, home visits (1976)	Decrease in dysentery and shigellosis attack rates with increasing water use ($\leq$ 20 lpcd versus $\geq$ 30 lpcd, p<.01).
	Khan[21]	Dacca	Field	Handwashing intervention; Family studies (1978)	67% reduction in infection rate and 84% reduction in case rate in household contacts; greatest reduction in those <10 yrs; rate lower in study families bathing and washing in $\geq$ 25 lpcd; water alone not effective.
S. dysenteriae	Khan[22]	Dacca	Field	Family studies (8-12/72)	Infection rate in household contacts significantly higher in families using water from some surface sources (p<.01); no difference for use of open versus closed latrine.
S. dysenteriae (provisional serotype 3341-55)	Huq	Dacca	Inpt/Outpt	Outbreak investigation (7/77)	Implicated meal consisted of cooked fish and vegetable, rice, lentil soup, and fresh pineapple.

TABLE 3
SUMMARY OF STUDIES OF RELATIONSHIP OF DIARRHOEAL DISEASE INDICATOR RATES TO WATER QUALITY, WATER AVAILABILITY, AND/OR EXCRETA DISPOSAL IN BANGLADESH

Reference	Sponsoring Agency	Area	Parameter	Study Design	Indicator(s)	Results/Conclusions
Sommer[1]	CRL	Matlab	Water quality, water availability	Prospective, longitudinal (field) (1968 - 1970)	Classical cholera infection incidence	Rate lower in children living close to tubewells than in those living farther away ($p<.02$).
Levine[10]	CRL	Matlab	Water quality	Retrospective, longitudinal (hospital) (1964-1974)	Non-cholera diarrhoea incidence	Rate higher in tubewell users than non-users ($p=.07$).
					Classical and El Tor cholera incidence	Rate higher in tubewell users than non-users ($p=.08$).
Curlin[5]	CRL, UNICEF	Matlab	Water quality	Prospective, longitudinal (field, hospital) (1975)	Diarrhoea incidence	Rate higher in tubewell users for drinking in 3 of 11 villages ($p<.001$), higher in non-users for drinking in 2 of 11 villages ($p<.05$ and $<.01$).
					El Tor cholera incidence	Rate higher in tubewell users in 2 of 6 two-month periods ($p<.05$ and $<.001$).
					Shigellosis incidence	Rates similar in tubewell users and non-users.
Skoda[28]	UNICEF,WHO	120 villages	Water quality	Cross-sectional	Diarrhoea and dysentery incidence	Rate lower in tubewell users (3.9%) than surface water users (7.5%) but similar to ringwell users (3.9%) for drinking

Table 3 (cont)

Reference	Sponsoring Agency	Area	Parameter	Study Design	Indicator(s)	Results/Conclusions
Rahaman[29]	CRL	20 thanas	Water quality, excreta disposal	Cross-sectional	Diarrhoea and dysentery incidence in families	Family rate in tubewell users (15%) less than users of tanks (19%) or dug wells (20%); family rate with sanitary latrines (15%) less than with unsanitary latrines (23%).
Rahaman[20]	CRL, UNICEF, IDRC	Teknaf	Water availability (use)	Prospective, longitudinal (field)(1976)	Dysentery incidence	Rate lower with use of larger volumes of water ($p<.01$).
					Shigellosis incidence	Rate lower with use of larger volumes of water ($p<.01$).
Spira[6]	CRL	Matlab	Water quality (10/76 - 1/77)	Prospective, longitudinal (field)	El Tor cholera incidence	Rate higher in families with household water for drinking or cooking contaminated with *V. cholerae* ($p<.001$).

TABLE 4
OUTLINE OF POTENTIAL STUDIES OF TRANSMISSION OF ENTERIC PATHOGENS
FOR DISEASE TRANSMISSION WORKING GROUP

Agent	Issue	Priority	Study Design	Additional Laboratory Techniques Required
V. cholerae (El Tor)	Explanation for cholera seasonality	1	1)Review of case rates, rainfall, temperature data (in progress)	None
		2	2)Case control and/or family studies during non-cholera and early and late cholera season.	None
		1	3)Systematic environmental surveillance including assessment of biological, physical, and chemical parameters.	Improved methods for environmental isolation.
	Infectivity and mode of transmission of MARV versus non-MARV strains	1	1)Family studies with environmental sampling (in progress)	Improved methods adapted to MARV isolation from the environment.
		1	2)Systematic environmental surveillance	"
	Definition of "protected" tank and effect of use on cholera rates	2	1)Correlation of tank features with coliform counts and *V. cholerae* isolation rates	None
		2	2)Surveillance of families in high rate villages using protected vs unprotected tanks.	None
	Role of contaminated bathing water in transmission	2	1)Surveillance of throat and gastro-intestinal infection rates in bathers in contaminated and uncontaminated sources.	None
	Survival and transmissibility of candidate oral vaccine strains	2	1)*In vitro* studies	Technique for selective isolation of vaccine strains.
		3	2)Environmental studies	"
		3	3)Family studies.	"

Table 4 (cont)

Agent	Issue	Priority	Study Design	Additional Laboratory Techniques Required
Campylobacter	Mode of transmission	1	1)Family studies (in progress)	None
	Environmental reservoirs	1	1)Environmental sampling	Improved methods for environmental isolation.
	Virulence factors	1	1)Serotyping, plasmid analysis pathogenicity testing of human, animal, and environmental isolates (in progress).	*Campylobacter* serotyping
G. lamblia	Incidence and risk factors	2	1)Review surveillance data (in progress)	Method for detection in environmental samples
	Mode of transmission	2	1)Case-control and family studies	
E. histolytica	Incidence and risk factors	2	1)Review surveillance data	Method for detection in environmental samples
	Mode of transmission	2	1)Case-control and family studies	
S. typhi	Incidence	3	1)Record review	None
	Mode of transmission	3	1)Case investigations	None
C. difficile	Incidence	3	1)Stools from clinic and hospitalized patients for culture and cytotoxin	Anaerobic isolation techniques; tissue culture assay for cytotoxicity

Table 4 (cont)

Agent	Issue	Priority	Study Design	Additional Laboratory Techniques Required
V. cholerae (classical)	Source and mode of transmission	2	1)Case-control and family studies	None
		3	2)Environmental studies	None
ETEC	Role of drinking water and food in transmission	1	1)Family studies	Simplified methodology for prompt detection of ETEC (?Elek test)
		1	2)Environmental studies	"
	Significance of animal reservoirs	1	1)Animal stool cultures in family studies	"
	Virulence properties of case and environmental isolates	2	1)CFA, type 1 pili, enterotoxin production, antibiotic sensitivity plasmid profiles, hemagglutination patterns	"
	Transmissibility of CFA positive and negative strains	2	1)Family studies	"
	Transmissibility of multiply antibiotic sensitive and resistant strains	3	1)Family studies	"
Rotavirus	Transmission of different serotypes:food/water versus person-to-person (fecal-oral) versus airborne; importance of animal contact	1	1)Handwashing intervention (see Table 5)	Identification of appropriate indicator organisms
		2	2)Family studies with environmental sampling when methodology available.	Technique for demonstration of rotavirus in environmental specimens.
Shigella	Source and mode of transmission in families and baris	1	1)Family studies with environmental sampling.	Improved methods for environmental isolation.
	Transmissibility and mode of spread of different serotypes.	2	1)Family studies with environmental sampling	Improved methods for environmental isolation

TABLE 5
OUTLINE FOR POTENTIAL INTERVENTIONS FOR EVALUATION BY DISEASE TRANSMISSION WORKING GROUP

Syndrome or Agent	Location	Priority	Intervention	Study Design
Diarrhoea	Dacca and/or Matlab	1	Disinfection of household water sources	Family studies
	Matlab	?1	Flood control/irrigation scheme	Surveillance in 1-2 villages in both areas; diarrhoea morbidity data in both areas.
	Dacca	2	Oxfam sanitation units in refugee camps	Surveillance in families using and not using Oxfam units or in camps or other areas prior to and after provision of units.
	Dacca and/or Matlab	?2	Duckweed in tanks	Surveillance in 1-2 villages with and without duckweed in tanks.
	Dacca and/or Matlab	2	"Protected" tanks	Surveillance of families using "protected" and unprotected tanks.
	Dacca and/or Matlab	3	Household water filters	Surveillance of families using and not using filters.
V. cholerae	Dacca and/or Matlab	1	Disinfection of household water sources	Family studies (MARV and non-MARV)
	Matlab	2	"Protected" tanks for bathing	Surveillance of families using "protected" and unprotected tanks.
Rotavirus	Dacca and/or Matlab	1	Handwashing	Family studies
ETEC	Dacca and/or Matlab	2	Disinfection of household water sources	Family studies
Shigella	Matlab and/or Teknaf	1	Handwashing	Family studies
	Dacca	2	Simplified handwashing instruction	Family studies

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DISEASE TRANSMISSION PROGRAMS AND PRIORITIES (1984-1987)

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The DTWG will carry out studies on how the diarrhoea spread so that intervention to interrupt transmission can be identified. In setting up the priorities: (1) the state of current knowledge on causative agent, cycle of occurrence, mode of transmission and population at risk (high/low); (2) the extent of the problem of each specific diarrhoea in Bangladesh; (3) external reviewers recommendations; (4) WHO priorities; and (5) consultation report of Dr J. Hughes (a senior epidemiologist in diarrhoeal diseases, from CDC who reviewed all studies of DTWG from 1960-1980) have been taken into consideration. In fact, the upgrading of the laboratory capability, facilities (space, proper washing rooms) and recruitment of young and senior staff for Microbiology Branch and DTWG form the most important priority without which high quality research cannot be achieved.

In order, starting with highest priority, these subjects are as follows:

A. V. cholerae O1: The reappearance of classical cholera overrides the priorities and thus studies on cholera stand as the first priority of DTWG. The mechanism by which classical biotype achieves such a crucial biological advantage to displace the existing El Tor strain in Bangladesh may be a key point in global control of cholera.

1. Plasimd, molecular genetic, surface protein analysis, phage typing and other conventional micorbiological studies: Such studies preferably in collaboration with other institutions may define some important characteristics of the new strain beyond those conventionally known and thus will provide significant clues to future epidemiological and vaccine development studies.

2. Study of survival and ecology of V. cholerae O1: The epi-fluorescent technique in detection of V. cholerae from water facilitates ecological studies of V. cholerae in aquatic environment during the inter-epidemic and epidemic periods. This study will be focussed on ecology and survival of V. cholerae in aquatic environment. The influence of ionic concentration, pH, salinity, temperature, other aquatic flora, plankton and shellfish etc. on the comparative growth of classical and El Tor will be studied and correlated with incidence of cholera in both area.

3. Studies on mode of tranmission: A number of studies in the past have been carried out on the subject and many factors such as source of water for drinking, cooking, bathing; type of latrine, role of visitors; food; role of boatman etc. have been indicated to play role in cholera transmission. A well designed case control family study to test the importance of all these factors in the chain of transmission of cholera in both rural and urban areas has to be undertaken.

4. Intervention studies: Recently both El Tor and classical biotypes of V. cholerae have been isolated from handwashings of the family contacts of index cases. A protocol to implement handwashing intervention is well justified to test the role of hands and personal hygiene in both rural and urban communities.

5. Vaccine development: Collaborative studies on vaccine development by genetic engineering (mutation by transducing phage), B-subunit, etc. will be continued. In addition, new information from plasmid, molecular genetic and surface protein analysis may hopefully give more accurate clues towards vaccine development.

B. Studies on Rotavirus: Rotavirus is the most common diarrhoea in children <5 years of age and accounts for about 40% of diarrhoeal admission in this age group. Therefore stuides on rotavirus form the 2nd priority area. However, the laboratory at present stage is not capable to initiate indepth studies on rotavirus. Therefore upgrading of laboraotry capability (establishment of serological technique, procurement of electron microscope, culturing facilities) and recruitment of a virologist are pre-requisites for thorough studies of rotavirus.

1. Studies on mode of transmission of rotavirus infection: The faecal-oral route has been reported for rotavirus transmission, but the vehicle of transmission is not known. In addition the air-borne spread still remains a controversial issue. Case control family studies to test the role of hands, food, water, upper respiratory infection and flies remain important to address the vehicle of transmission.

2. Stuides on epidemiology of rotavirus: The specific immunological response to rotavirus by serotype and cross-protection against different serotypes as well as animal rotavirus is a key issue is regard to future vaccine development. A community-based cohert study may provide important information on the subject but such study cannot be done unless the upgrading of the laboratory as mentioned above is achieved.

3. Intervention studies: On the basis of feasibility study that showed high detection rate of rotavirus from the handwashings of attendants of children with rotavirus diarrhoea a community based study to test handwashing intervention on rotavirus has been started in Nandipara. Depending on the results of this study such an intervention can be carried out in rural area.

C. Shigella: Shigella because of its high mortality and contribution to malhutrition forms the 3rd priority of DTWG. Review of past studies showed that water and particularly personal hygiene are important in the spread of infection. Although sero-epidemiological studies have not been carried out in the past, the trends in age distribution of shigellosis may indicate some protection to disease in older age group. In fact, we do not know whether shigella infection can give significant protection against homologous or heterologous species. In order to get this information it is important to establish simplified techniques for identification and sero-epidemiological studies by species and subserotype.

1. Establishment of techniques for detection and characterization of Shigella. Studies on development of a selective media, plasmid profile, molecular genetic, colicin typing, serology etc. are some areas to be focussed for establishment of simplified technique.

2. Extension and acceptability of handwashing intervention in rural area: Controlled community based studies in Teknaf where the incidence of shigellosis is high may test the efficacy, acceptability and cost-effectiveness of handwashing with soap and water.

3. Sero-epidemiological studies: With development of simplified techniques sero-epidemiological studies could be carried out. Such study is key issue for vaccine development attempt.

D. Enterotoxigenic E. coli: ETEC is the second common agent responsible for diarrhoea and 4th priority area for research. In the past only few studies on ETEC has been carried out.

1. Development of simplified techniques: ELEK test (already established), development of techniques for use of gene probe, gel-diffusion, coaglutination, identification of E. coli by a phage and serology may provide us with tools for epidemiological studies.

2. Studies on mode of transmission: Case control family studies to focus on role of water, food, hands and significance of animal reservoirs may give important information on chain of transmission of ETEC.

3. Sero-epidemiological studies: Community-based sero-epidemiological studies along with establishment of a surveillance system for ETEC may provide useful information towards any vaccine development attempt.

E. Campylobacter studies: Campylobacter forms the 3rd common agent isolated from diarrhoea cases and healthy persons. However, the extent of the problem yet remains to be determined. The characterization of Campylobacter as a cause of diarrhoea and further studies on the subject form the next priority area.

1. Studies on pathogenic mechanism of Campylobacter and serological and biotyping scheme: The ongoing protocol on pathogenic mechansim of Campylobacter and establishment of serological standard and biotyping scheme will be continued in order to provide us with tools for proper epidemiological studies.

2. Sero-epidemiological studies: A cohert study of newborns with obtaining baseline sero-epidemiological data for both infants and their family contacts followed by establishment of a surveillance system for Campylobacter diarrhoea and serological studies may address the trends in immunological response to Campylobacter. Additionally, the role of animal and poultry in infection and cross protection against different biotypes of Campylobacter can be studied. Such information is pre-requisite to any attempt towards vaccine development.

3. Studies on mode of transmission: Case control family studies to test the role of hands, water, food and flies in the chain of transmission along with rectal swabbing of animal and poultry may give important information on mode of transmission.

4. Interventions: Depending on mode of transmission appropriate protocols for intervention on its transmission can be developed.

F. Studies on Protozoa: Studies on epidemiology of G. lamblia and E. histolytica in the past were limited. With improved and simplified techniques, studies on mode of transmission, immunological responses and risk factors for these agents can be carried out.

G. Miscellaneous:

1. Hospital-based surveillance system for Teknaf: A surveillance system similar to Dhaka and Matlab for Teknaf will be initiated in future with a view to monitoring the pattern of disease there.

2. MARV monitoring system: This study will be continued.

3. Identification and characterization of new organisms responsible for diarrhoea: Isolation and characterization of new agents responsible for diarrhoea will be continued.

Public Health

CLASSICAL VIBRIO CHOLERAE BIOTYPE DISPLACES EL TOR IN BANGLADESH

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Summary The El Tor biotype of *Vibrio cholerae* caused all endemic and epidemic cholera in Bangladesh from 1973 until Sept. 3, 1982, when the first classical strain was isolated from a patient in Matlab. Since then the number of isolations of the classical biotype has increased very rapidly and spread to other districts, replacing the El Tor biotype as the main epidemic strain. The classical strains isolated in the 1982 outbreak were indistinguishable by the standard tests from those isolated a decade ago and the very few isolates in 1979, 1980, and 1981. This suggests that beyond the taxonomic traits used to identify the classical and El Tor strains, there may be other more crucial biological characteristics that have given this new strain an advantage over the existing strains. The mechanism by which a new biotype of *V. cholerae* 01 achieves such a crucial biological advantage to displace the existing strains may be a key point in control of the global spread of cholera.

INTRODUCTION

THE classical biotype of *Vibrio cholerae* caused both endemic and epidemic cholera from the time of its discovery in 1883 until about 1960. The El Tor biotype discovered in 1905 caused four outbreaks in the Celebes (Indonesia) in 1937–38, 1939–40, 1944, and 1957–58. In 1961–62 El Tor began major epidemic spread through South-east and South Asia, then westward.[1] Since then the El Tor biotype has not only swept previously uninfected areas but has also displaced the classical biotype from areas such as the Ganges river basin, where it remained endemic and epidemic until 1972.[2]

In Bangladesh the El Tor biotype of *V. cholerae* was first isolated in Chittagong in 1963,[3] then in Dhaka in 1964; but the first important outbreak was not reported until 1968.[4] Sporadic cases were reported each year until 1972.[5] In 1973 the classical biotype of *V. cholerae* was replaced entirely by the El Tor biotype in Bangladesh. Since then each year in thousands of isolates from patients and environmental samples only El Tor was found until October, 1979, when 5 cases of cholera due to classical biotype were detected.[6] There was 1 further isolation in 1979, 3 isolations were made in 1980 and 2 in 1981. On Sept. 3, 1982, a classical strain was isolated from Hajiganj, Matlab. Since then the number of isolations of the classical biotype has increased very rapidly and spread to other districts, replacing the El Tor biotype as the main epidemic strain of 1982. In the last outbreak of this epidemic more than 90% of clinical cases were due to the classical biotype.

METHODS

The International Centre for Diarrhoeal Disease Research, Bangladesh (I.C.D.D.R.,B.), operates three main treatment centres for diarrhoeal diseases in Dhaka, Matlab, and Teknaf (fig. 1). Support is provided for urban and rural community treatment centres, and five medical teams were active in other parts of Bangladesh together with Government health workers. Some samples for culture were sent independently from several communities.

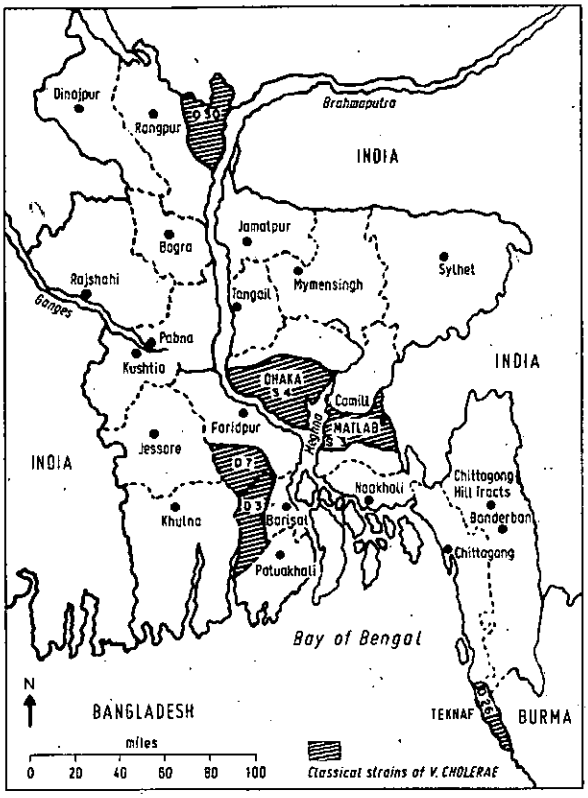

Fig. 1—Districts where classical strains of *V. cholerae* have been isolated from patients by date of isolation (S = September, O = October, D = December).

A total 16 819 rectal-swab specimens from most districts were processed by the Microbiology Branch of I.C.D.D.R.,B., between Sept. 1 and Dec. 31, 1982. Specimens from Dhaka included rectal swabs from a 4% random sample of all patients who visited the I.C.D.D.R.,B., treatment centre. Additional rectal-swab specimens were collected from patients admitted to the Dhaka centre for special care or studies. Swabs from family contacts of 100 index patients were cultured during the same period. The Matlab and Teknaf data consisted of, respectively, 2348 (Sept. 1–Dec. 31) and 355 (Oct. 1–Nov. 30) rectal swabs from patients who came to these treatment centres. 504 rectal-swab specimens from suspected cholera patients were sent to the microbiology branch from Noakhali, Mymensingh, Chittagong, Comilla (excluding Matlab area), Rangpur, Pabna, Tangail, Sylhet, Barisal, and Faridpur districts and outer Dhaka by the I.C.D.D.R.,B., teams and Government hospitals during diarrhoea outbreaks. The I.C.D.D.R.,B., teams investigated the outbreaks and trained the health staff in management and control of outbreaks of diarrhoea. Rectal-swab specimens obtained from districts were limited to severely dehydrated patients suspected of having cholera.

A cotton rectal swab impregnated with potassium tellurite was streaked directly onto gelatin agar and taurocholate-tellurite-gelatin agar (TTGA) and transferred for enrichment in taurocholate-tellurite-peptone water medium. After 6–18 h on enrichment medium the material was subcultured onto TTGA medium. All plates were incubated overnight at 35°C and read. In the field the culture plates were incubated at room temperature for a longer

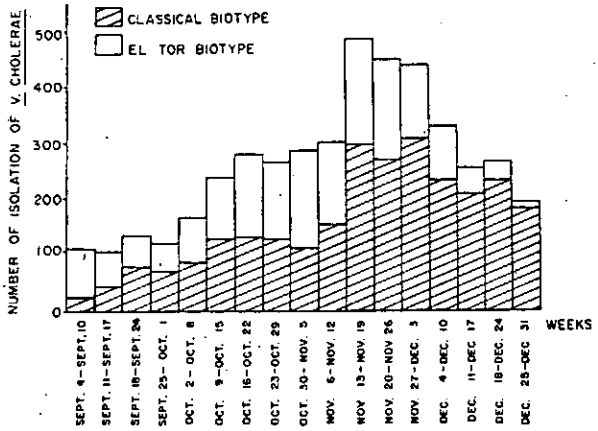

Fig. 2—Number of *V. cholerae* isolates by biotype per week for Dhaka, Sept. 4 to Dec. 31, 1982.

period. Colonies that on culture plates resembled *V. cholerae* 01 were confirmed by means of slide agglutination with polyvalent 01 and monospecific Inaba and Ogawa antisera.

All serologically confirmed *V. cholera* were checked for agglutination with 2·5% chicken erythrocytes, sensitivity to a polymyxin B 50 IU disc, and sensitivity to Mukerjee's classical phage group IV and El Tor phage group 5. A strain was designated "classical" if it did not agglutinate chicken erythrocytes, was sensitive to the classical group-IV phage, resistant to El Tor group-5 phage, and sensitive to polymyxin B.

RESULTS

Cholera is both endemic and epidemic in many countries. The seasonal peak incidence of cholera varies from one country to another. Cholera has two seasonal peaks in Bangladesh, the major peak between August and December and a smaller one in late spring.[7] The major peak of epidemic cholera in 1982 lasted from the third week of November until the second week of December and subsided rapidly, despite enhanced reporting and case-finding by the health authorities. Owing to rapid reporting and despatch of Government and I.C.D.D.R.,B., teams, deaths were minimised in all areas, as well as within the I.C.D.D.R.,B., areas of direct responsibility.

In Dhaka between Jan. 1 and Sept. 3, 1982, 1958 rectal-swab specimens out of 13 111 were found to be positive for *V. cholerae*. All were of the El Tor biotype of both serotypes, Inaba and Ogawa. The first isolation of the classical biotype in Dhaka was made on Sept. 4 from an 80-year-old woman from Narayanganj, 12 miles south of Dhaka. Fig. 2 shows the number of *V. cholerae* isolates by biotypes per week for Dhaka between Sept. 4 and Dec. 31, 1982. The replacement of El Tor by classical biotype progressed steadily. In the last week of December it accounted for about 90% of all cholera cases. The first isolation of the classical biotype of *V. cholerae* in Bangladesh as a whole was made on Sept. 3 from a patient admitted to the Matlab centre from Hajiganj in Comilla district, 20 miles away. The number of isolations of *V. cholerae* by biotype and serotype for each district is shown in the table. All except two isolates of the classical biotype were due to the Inaba serotype and belonged to phage type 3. Classical strains isolated in the 1982 outbreak were indistinguishable by the same standard tests from those isolated a decade ago and the few isolates in 1979, 1980, and 1981. Clinically, classical cholera could not be distinguished from El Tor. Fig. 1 shows the districts where the classical biotype of *V. cholerae* has been isolated with date of isolation. This includes the Southern part of Dhaka district and some areas in Comilla, Barisal, Faridpur, Rangpur, and Chittagong districts. 3 to 4 weeks after the first isolation of the classical biotype of *V. cholerae* in Matlab (Sept. 3) and Dhaka (Sept. 4) isolates were received from other districts.

DISCUSSION

From 1960 the El Tor biotype of *V. cholerae* 01 gradually replaced the classical biotype from all its prior geographical loci; rarely, isolated cases due to the classical biotype occurred.[2,8] On Sept. 3, 1982, a new strain of *V. cholerae* with the markers for "classical" biotype appeared in Bangladesh and rapidly displaced the long-dominant El Tor strain. It is not yet known if such a shift has also taken place in other regions where cholera exists, since biotyping may not be done routinely. Nonetheless, the replacement of El Tor by classical biotype in Bangladesh suggests that beyond the taxonomic traits used to categorise as "classical" or "El Tor", there may be other more crucial biological characteristics not detected so far that have given this new strain an advantage over the existing strain. Such an advantage may also pertain in other countries. The nature of the biological advantage of the new biotype is not known.

Genetic analysis may allow these important characteristics to be defined. Factors such as special modes of survival in ecological niches outside the human body, modification of determinants of adhesion to gut epithelial cells, resistance to gastric acid, improved competitive traits against other bacteria in and outside the gut should also be studied.

NO. OF ISOLATIONS OF V. CHOLERAE BY BIOTYPE AND SEROTYPE FOR DHAKA AND OTHER DISTRICTS, SEPT. 1 TO DEC. 31, 1982

Districts	Total rectal swabs and stool examined	Classical			El Tor			Total
		Inaba	Ogawa	Total	Inaba	Ogawa	Total	
Dhaka	13 630	2628	2	2630	764	987	1751	4381
Comilla*	2419	859	0	859	175	264	439	1298
Chittagong	335	1	0	1	23	1	24	25
Barisal	163	63	0	63	1	3	4	67
Sylhet	87	0	0	0	8	0	8	8
Mymensingh	85	0	0	0	50	2	52	52
Noakhali†	14	0	0	0	1	2	3	3
Pabna	5	0	0	0	2	0	2	2
Rangpur†	73	1	0	1	13	11	24	25
Faridpur	3	1	0	1	0	1	1	2
Khulna†	2	0	0	0	0	1	1	1
Tangail†	3	0	0	0	1	1	2	2
Total	16 819	3553	2	3555	1038	1273	2311	5866

*All but 71 samples are from Matlab treatment centre.
†Samples sent by health workers.

I.C.D.D.R.,B., is investigating the characteristics of this new epidemic strain. The centre will be happy to collaborate with other international institutions for exchange of information and strains for further studies which may identify important new traits. It is an urgent matter to apply at an early stage the best current technology and expertise to this new strain and identify what characteristic has allowed its rapid spread and current dominance in Bangladesh. We also emphasise the importance of routine testing of all *V. cholerae* 01 strains for their biotypes by all laboratories with appropriate facilities.

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Hospital Practice

WHY ADMIT STROKE PATIENTS TO HOSPITAL?

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Summary Stroke patients consume nearly one-twentieth of all National Health Service resources, and much of this is attributable to the admission of patients with acute strokes to hospital. However, patients rarely need to be admitted for diagnostic or therapeutic reasons, and rehabilitation given in hospital is sometimes inappropriate. The major reason for admission relates to nursing during the acute illness, yet this could be done at home in more cases than at present. It is suggested that rehabilitation services should be more readily available to patients at home, so that fewer need to be admitted and so that those admitted can return home sooner. This might lead to a more appropriate rehabilitation, less anxiety and depression in the patient and his family, and a more efficient use of limited resources.

INTRODUCTION

STROKE consumes 4·6% of all National Health Service resources,[1] and most of this expenditure occurs within hospitals. Stroke patients account for 6% of all hospital running costs and occupy 13% of all general medical bed-days and 25% of geriatric bed-days.[1] Stroke is the third commonest single cause of hospital admission (after tonsillectomy and myocardial infarction),[2] and about 8–11% of admissions to acute medical wards are for stroke.[3]

Many patients will be in hospital for only a small part of the total duration of their illness. Most have their strokes at home (138 of the first 170 in a personal series), and 82–85% of all survivors will return to the community within a year.[4,5] At present it is assumed that hospital admission is important for stroke patients. The World Health Organisation recommends admission[6] for all strokes, and some American neurologists consider it essential.[7] On the other hand, some authors[4,8-10] have proposed that there should be more emphasis on care and rehabilitation at home. Before this proposal is taken further, it is important to consider the possible reasons for admitting patients to hospital.

ADMISSION FOR DIAGNOSIS

"Stroke" is a clinical diagnosis, and as such it has a differential diagnosis. This includes space-occupying lesions (e.g., tumour, abscess, subdural haematoma), infection (e.g., bacterial meningitis, encephalitis), metabolic disease (e.g., hypoglycaemia), and post-epileptic (Todd's) paralysis, as well as other acute medical illnesses presenting with stroke (e.g., myocardial infarction). How many patients given a diagnosis of stroke actually turn out to have an alternative (remediable) disease is difficult to determine, because most reported studies are biased by selection arising from the original criteria for referral.

Nevertheless the clinical diagnosis of stroke is probably fairly accurate. In a series[11] of 206 patients referred to a stroke unit with a diagnosis of stroke or transient ischaemic attack (TIA), 2 were found to have had a myocardial infarction, 1 had *Listeria* meningitis, 1 had post-epileptic paralysis and 1 had Bell's palsy. In another series[12] of 1004 stroke patients admitted to a geriatric ward, only 4 were found to have a tumour on further investigation. In a third series[13] of 821 patients admitted to an acute stroke ward, 108 were found to have a non-vascular cause for their symptoms. 42 of these were recovering from seizures. More importantly, 9 of the 108 had a malignant cerebral tumour, 3 had a subdural haemorrhage, and 1 had acute multiple sclerosis. That study also showed that the introduction of routine early computerised tomographic (CT) scanning did not reduce the rate of misdiagnosis but that clinical experience (and the passage of time) increased diagnostic accuracy.

Some authors have suggested that misdiagnosis may be more common. Early studies[14,15] found a misdiagnosis rate of 2–3%, whereas a report[16] based on CT investigation gave a rate of 8%. However, these studies were on patients usually selected by virtue of their suitability and need for further investigation, and most of the diagnostic errors were in young patients and those with atypical strokes.

Clinical differentiation of the various types of stroke is less certain. In the series[11] of 206 patients referred to a stroke unit with a clinical diagnosis of stroke or TIA, 177 had a final diagnosis of stroke (23 had a TIA and 6 had another disease, as discussed above). In 144 of these 177, the initial diagnosis of the type of stroke (embolic, thrombotic, haemorrhagic, or indeterminate) agreed with the final assessment. Cerebral haemorrhage was the least likely to be diagnosed correctly: of 20 initially diagnosed as haemorrhage, only 6 were correct, and a further 12 true haemorrhages were initially diagnosed

as thrombotic, embolic, or indeterminate strokes. The Canadian study[13] found that clinical experience also improved the diagnostic accuracy of the type and location of stroke.

Enthusiasm for diagnostic accuracy should always be tempered by three considerations. First, the need for increased diagnostic accuracy (particularly of the type or location of the stroke) should depend on the extent to which management will be altered as a result. Secondly, most investigations can give both false-positive and false-negative results (e.g., a single CT scan can be normal in the early stages after a thrombotic or embolic stroke,[17] electrocardiographic changes seen after stroke may be a consequence of the stroke and not indicative of its cause[18]). Thirdly, many investigations entail some risk for the patient (e.g., arteriography may lead to deterioration,[19] some patients are allergic to CT-scan contrast material).

Clinicians realise that diagnostic investigation is often unnecessary. In Manchester in 1974 Brocklehurst[20] found that of 92 patients who were admitted to hospital and survived 2 weeks, only 2 had angiography, 4 had lumbar punctures, and 6 had EEGs. In one study in the U.S.A. patients discharged from hospital had had an average of only nine of the twenty tests then currently recommended for stroke patients.[21]

ADMISSION FOR TREATMENT

After a stroke there are three major aims in treatment. The first is to support life. The second is to minimise irreversible brain damage. The third is to maximise the patient's functional recovery.

It has been suggested[22] that all stroke patients should be admitted to special stroke intensive-care wards, but there is no evidence from controlled trials to warrant this. However, many patients cannot receive the amount of nursing care they require at home, and they have to be admitted for this reason. In the Manchester study,[20] the general practitioners indicated that "social reasons for admission" were present in 89% of those admitted, as against "medical reasons" in 50%. Analysis of the details relating to the stroke showed that admission was related to severity but that social factors (e.g., living alone) were equally important. However, it must not be forgotten that in many cases the relatives, aided by the district nursing service, can give sufficient nursing care.

Many treatments have been recommended for reducing cerebral damage, but a British review[23] concluded: "No specific method of treatment that has been efficiently evaluated has been convincingly shown to be of benefit". Similarly, American reviews[7,24] agree that no treatment has been shown to be of definite benefit by controlled clinical trials, although they do still suggest that anticoagulation or steroids may help some patients.

Surgery is rarely necessary. It can be worth while in patients with intracerebellar haematoma,[25] but a randomised controlled trial showed that large-scale evacuation of intracerebral haemorrhage is not of benefit.[26] The role of arterial bypass surgery is being evaluated,[27] and the value of surgery on the carotid artery has yet to be established.[28]

Maximisation of the patient's recovery is usually the responsibility of the various therapists, although there is one unconfirmed report[29] that naftidrofuryl may be of benefit. At least two studies[30,31] have confirmed that rehabilitative therapy is beneficial. However, whereas referral to hospital may be necessary to gain access to rehabilitation, there is no suggestion that it needs to be carried out there.

ADMISSION TO ESTABLISH THE CAUSE AND PREVENT RECURRENCE

Some underlying diseases may warrant treatment after stroke.[32] Control of hypertension[33] and reduction of the haematocrit in polycythaemia rubra vera[34] reduce long-term morbidity and mortality after an acute stroke. Anticoagulation will probably benefit patients who have rheumatic heart disease with atrial fibrillation,[35] despite the problems associated with control of these drugs.[36] However, there is less evidence that warfarin will benefit other patients with presumed embolic strokes, and this may reflect the difficulty in controlling anticoagulation,[36] particularly for short courses of treatment. There is no evidence yet that any specific treatment will benefit patients found to have carotid atheroma.

WHEN IS ADMISSION NECESSARY?

No study has attempted to evaluate specific criteria for hospital admission, and any criteria will anyway need to be interpreted flexibly. Nevertheless we suggest the following guidelines:

1. When the diagnosis is in doubt.—Because the clinical diagnosis is usually accurate, only those patients who are unusual by virtue of their age, presentation, or progress need admission for diagnostic reasons.

2. When the nursing care necessary cannot be given at home.—This will depend on the combination of the degree of disability and the social circumstances for each patient. It is likely that more patients could be nursed at home by relatives if more use was made of the district nursing service.

3. When active therapeutic intervention is possible.—In practice this is very rare, because no therapeutic manoeuvre has been shown to be of benefit.

4. When the underlying cause needs investigation.—This will rarely be necessary. Further investigation to elucidate any underlying causes for the stroke can usually be carried out from home by the general practitioner, with outpatient hospital attendance if necessary.

DISADVANTAGES OF HOSPITAL ADMISSION

Rehabilitation in hospital is sometimes not approrpriate to the patient's needs at home, and this can lead to several types of problem. Patients may learn skills in hospital that they do not use at home,[37] either because they are not needed or because they are not appreciated by the patient or his family. After discharge from hospital many patients and their families feel rejected and depressed,[38] and this is particularly likely if preparation for discharge is inadequate. Smith and others[39] noted that 8% of stroke patients discharged from medical wards were not provided with the commode that they needed.

There are also some physical risks. It has been suggested[10,40] that the transfer of a patient soon after a stroke could increase his chances of dying, although there is no evidence to support this contention.[41] There are also iatrogenic risks associated with hospital stay (e.g., infection with resistant organisms, complications arising from investigations).

Lastly it must be recalled, as mentioned in the introduction, that the management of strokes consumes large amounts of hospital resources. At present this amounts to about £70 to £100 per day. More importantly, a hospital bed occupied by a stroke patients is unavailable to other, perhaps more needy, patients.

Concurrent classical and El Tor Cholera:

A Prospective Family Study

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Summary

In 1973, the classical biotype of Vibrio cholerae was replaced entirely by the El Tor biotype in Bangladesh. Since then El Tor was the main strain responsible for endemic and epidemic cholera, however a few classical isolates were detected in 1979, 1980 and 1981. In an outbreak in 1982 the El Tor biotype was displaced by a new strain (classical). This presented a unique opportunity to study the epidemiology of both biotypes simultaneously. The results of our findings show that the hospitalization rate of family contacts was higher if they acquired the classical biotype suggesting that disease due to the classical strain was more severe. Similarity in age attack rates for both Classical and El Tor strains might be suggestive of identical antigenic determinants. Infection rates were higher in children than adults in both classical and El Tor. However with infection by the classical biotype case rates were higher in children than in the adults. Infection rates with classical V. cholerae were higher in females than in males among family contacts. Although isolates of V. cholerae from water sources were similar in both biotypes, the handwashings of family contacts of cases infected by El Tor were positive more often than for contacts of classical infection. These observations do not pinpoint advantage of the new classical strain enabling it to displace the entrenched El Tor biotype. However the greater virulence and low presence in handwashings suggests more efficient infective mechanisms with a lower infective dose.

Introduction

In 1961 a pandemic of cholera due to the El Tor biotype began spreading across the world from its endemic focus in the Celebes[1]. However, it was not until eleven years later that V. cholerae El Tor replaced the "classical" biotype as the cause of endemic and epidemic cholera in Bangladesh[2]. From 1973 until 1982 rare isolates of the classical biotype occurred in 1979, 1980 and 1981[3,4]. From September 1982 onward the El Tor was rapidly replaced by the classical biotype during an epidemic of cholera[4].

The first case of the classical biotype early during this epidemic was isolated from a patient admitted to the Matlab Treatment Centre on September 3, 1982. The next case observed was admitted to the Dhaka Treatment Centre on September 4. Since then cases were seen from many other districts[4]. Dhaka experienced a sharp rise in cholera cases during September and October due to both biotypes.

The exceptional concurrence of two different biotypes in a single epidemic presented a unique opportunity to study their comparative epidemiology simultaneously.

Materials and Methods.

All cases of watery diarrhoea coming to the Dhaka Treatment Centre, International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B)

and suspected for cholera were enrolled sequentially for the study. Rectal swabs were taken from all enrolled patients and cultured for V. cholerae. The first bacteriologically confirmed case of classical cholera each day was taken as an index case and was matched for age and type of housing (socio-economic status) with the next El Tor case in sequence from the patients treated on the same day as a control.

The first case in a family admitted to hospital was defined as an index case. All family members of the index cases living at home were considered as family contacts. A family was defined as members living together and eating from the same cooking pot. The term neighbourhood contact was used for those living in the same courtyard but not eating from the same cooking pot. In this paper contacts mean both family and neighbourhood contacts of an index case and infection indicates that V. cholerae was isolated from his/her stool by culture. Infected contacts who had 3 or more loose motions per day were defined as secondary cases. Patients with diarrhoea were treated with ORS except for severe cases who were admitted to the hospital. Severe diarrhoea was defined and assessed by WHO guidelines[5].

The families of the index cases and controls were visited on the second day of their selection (2nd day of admission). Demographic information and history of diarrhoea in each family member was obtained.

Daily rectal swabs from all members of the family and the neighbourhood contacts were taken for 7 successive days. In families with positive cultures the daily rectal swab was continued after 7 days until the last positive case became culture negative for V. cholerae on 3 consecutive days.

Field workers swabbed the hands of the family contacts of cholera cases with 100 ml of 1% bile peptone, pH 8.5 in sterile bowls for isolation of V. cholerae for 5 days. Water samples were collected from the sources used by the families of index cases (tap/tube well/ponds/rivers/canals) for five successive days in triple strength bile peptone water.

A potassium tellurite impregnated cotton rectal swabs was streaked directly onto gelatin agar (GA) and taurocholate tellurite gelatin agar (TTGA) and inoculated in taurocholate tellurite peptone water (TTP) media for enrichment. Subcultures were made onto TTGA medium after the 6-18 hours enrichment. All plates were incubated overnight at 35°C and read. In the field the culture plates were kept at room temperature (about 25°C-30°C) for a longer period. Colonies on culture plates resembling V. cholerae O1 were identified by slide agglutination with polyvalent O1 and mono specific Inaba and Ogawa antisera. The antigenically confirmed V. cholerae strains were checked for agglutination with 2.5% chicken erythrocytes, sensitivity to Mukerjee's classical phage group IV and El Tor phage group V and polymyxin B (50 ug disc).

A strain was designated as "classical" if it did not agglutinate chicken erythrocytes, was sensitive to the classical group phage IV, resistant to El Tor group phage V and sensitive to polymyxin B[4].

Analysis of data was done by hand tabulation with testing for significance by z test, chi-square or Fisher exact test.

Results

The family and neighbourhood contacts of 45 index cases of classical and 45 index cases of El Tor were followed. There were 434 contacts in the classical and 395 in El Tor group.

Table I presents case rate, infection rate, infection-to-case ratio and hospitalization rate. Among all contacts hospitalization rates were higher in those infected by classical as compared to El Tor ($p = 0.005$). Family contacts were even more often hospitalized ($p = 0.01$). In contrast case rates, infection rates and infection-to-case ratios were not significantly different ($p>0.05$).

The infection rate was higher in family contacts of an index case infected with the classical biotype than in the neighbourhood contacts ($p<0.01$). This was not so if the index case was due to El Tor.

In family contacts of classical index cases, both infection and case rates were respectively higher in children (<15 years) than in adults (≥15 years) ($p<0.05$; $p<0.01$) whereas in family contacts of El Tor index case only the infection rate was higher in children ($p<0.05$) but not the case rate ($p>0.05$). Comparison of case and infection rates between young children (<5 years) and adults (≥15 years) followed the same trends (Table II).

Infection rate was higher in adult females than in adult males ($p<0.01$) if the index case was due to the classical strain (Table III). This was not true for contacts of an El Tor index case. The infection rates among the family contacts of classical cholera were 26.1% (6/23) when the index case was male and 35.1% (26/74) when the index case was a female ($p>0.05$), whereas in El Tor group the infection rates were 30.0% (3/10) when the index case was male and 44.0% (11/25) when the index case was female ($p>0.05$).

V. cholerae was isolated from handwashing of the El Tor family contacts more frequently than from classical family contacts ($p<0.01$). There was no difference in rate of isolation of V. cholerae from water samples between the two groups ($p>0.05$). Isolation of mixed biotypes from water was common during this epidemic.

Discussion

The results of our study confirm the earlier findings of Khan et al[6] that the differences in case and infection rate and infection-to-case ratio between the classical and El Tor contacts were not significant. However, disease due to the new strain (classical) was clearly more severe leading to more frequent hospitalization. This would conform to the observations of Woodward et al[7] and Bart et al[8] that the percentage of infected family contacts developing severe disease was higher for classical than in El Tor cholera.

Similarity of rates of age attack indicate that differences in levels of immunity (local or systemic) did not play an important selective role, for if the new classical strain had antigenic determinants important for infection it would be expected that age incidence would be shifted toward older individuals and small infants would not have been as well protected by breast milk antibody[9].

Infection rates were significantly higher in young children for both classical and El Tor. This was seen previously[6-8] and could be due to closer association of young children with the patients, contaminated environments and poor immunity. The higher case rate in children than in the adult contacts of classical index case could be possibly due to greater potency of toxin in classical strain since in classical group the disease was more severe than in El Tor group as indicated by higher hospitalization rate in the classical group.

The infection rate in family contacts of classical index case was significantly higher than in neighbourhood contacts whereas this was not so in El Tor contacts. This might indicate that classical strain may spread its infection by a more direct faecal-oral route to close contaacts. The infection rate in El Tor contacts was equally distributed between family and neighbourhood. This might suggest that El Tor in addition to direct faecal-oral manner of transmission possibly due to its hardier nature and longer survival could spread infection more freely, even to the distant contacts (neighbourhood). This argument is further supported by the evidence of higher infection rate seen among the adult female contacts of classical index cases than in the males. Even though adult females were directly in contact with excreta and utensils of patients in both groups. Furthermore, the isolation of V. cholerae from handwashing of family contacts of classical index case was significantly lower than that of El Tor. This also may support the direct faecal-oral manner of spread of infection to close family contacts by classical strain.

Isolation of both classical and El Tor biotypes of V. cholerae from storage containers and sources of water suggests that water is important in the transmission of both biotypes of the cholera. Nonetheless the higher isolation of El Tor from the handwashing of family contacts and similar distribution of infection rate between family contacts and neighbourhood contacts in El Tor group may suggest

that in addition to water-borne transmission[10] and direct faecal-oral manner of spread of infection, person-to-person transmission of cholera due to El Tor biotype may also be of importance. This finding supports observation of Stock[11] who suggested person-to-person transmission of cholera (El Tor) in deserts of Chad and North Cameron during festivals, feasts and funerals.

The results of this study suggest that the new strain of classical biotype of V. cholerae has the same antigenic determinants, however the causes more severe illness. The main question to be answered is, how did the new classical strain reappear, displace the existing El Tor epidemic strain and what would be its behaviour in future? These are important points which have to be considered in relation to vaccine development and the global control of cholera.

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TABLE I - CASE RATE, INFECTION RATE, INFECTION-TO-CASE RATIO AND HOSPITALIZATION RATE OF CLASSICAL AND EL TOR BIOTYPE OF V. CHOLERAE

Contacts	Classical n/N(%)	El Tor n/N(%)	P-value	Classical n/N(%)	El Tor n/N(%)
Family Contacts:					
Case rate	19/255(7.5%)	16/233(6.9%)	NS	19/255(7.5%)	16/
Infection rate	44/255(17.3%)a	39/233(16.7%)	NS	44/255(17.3%)a	39/
Infection-to-case-ratio	44:19 (2.3:1)	39:16 (2.4:1)	NS	44:19 (2.3:1)	39:
Hospitalization rate	9/19(47.4%)	1/16(6.3%)	p=0.01*	9/19(47.4%)	1/
Neighbourhood Contacts:					
Case rate	6/179(3.4%)b	7/162(4.3%)	NS	6/179(3.4%)b	7/
Infection rate	12/179(6.7%)	21/162(13.0%)	NS	12/179(6.7%)	21/
Infection-to-case ratio	12:6 (2.0:1)	21:7 (3.0:1)	NS	12:6 (2.0:1)	21:
Hospitalization rate	1/6 (16.7%)	0/7 (0)	NS	1/6 (16.7%)	0/
Contacts(Family & Neighbourhood):					
Case rate	25/434(5.8%)	23/395(5.8%)	NS	25/434(5.8%)	23/
Infection rate	56/434(12.9%)	60/395(15.2%)	NS	56/434(12.9%)	60/
Infection-to-case ratio	56:25 (2.2:1)	60/23 (2.6:1)	NS	56:25 (2.2:1)	60/
Hospitalization rate	10/25 (40.0%)	1/23 (4.3%)	p=0.005*	10/25 (40.0%)	1/

*Two tailed Fisher exact test

2 x 2 chi Square test: a vs b = p<0.01

TABLE II - CASE RATE AND INFECTION RATE IN RELATION TO AGE

Age	Classical		El Tor	
	Case	Infection	Case	Infection
Total (Male & Female)				
<5 years	11/93(11.8)[a] } [g]	21/93(22.6)[c] } [h]	8/90(8.9)	22/90(24.4)[e] } [i]
5-14 years	8/133(6.0) } [g]	20/133(15.6) } [h]	8/124(6.5)	19/124(15.3) } [i]
>15 years	6/208(2.9)[b]	15/208(7.2)[d]	7/181(3.9)	19/181(10.5)[f]
Total	25/434(5.8)	56/434(12.9)	23/395(5.8)	60/395(15.2)

2 x 2 Chi square test: a vs b $p<0.01$; c vs d $p<0.01$; e vs f $p<0.01$

g vs b $p<0.05$; h vs d $p<0.01$; i vs f $p<0.05$

TABLE III - CASE RATE AND INFECTION RATE IN RELATION TO SEX

Sex	Classical		El Tor	
	Case	Infection	Case	Infection
Male				
<5 years	4/36(11.1)	7/36(19.4)	5/50(10.0)	11/50(22.0)
5-14 years	2/64(3.1)	9/64(14.1)	3/71(4.2)	9/71(12.7)
≥15 years	1/92(1.1)	1/92(1.1)[a]	3/76(4.2)	9/76(11.8)[a1]
Female				
<5 years	7/57(12.3)	14/57(24.6)	3/40(7.5)	11/40(27.5)
5-14 years	6/69(8.7)	11/69(15.9)	5/53(9.4)	10/53(18.9)
≥15 years	5/116(4.3)	14/116(12.1)[b]	4/105(3.8)	10/105(9.5)

By z test: a vs b $p<0.01$; a vs a_1 $p<0.001$

TABLE IV - ISOLATION OF V. CHOLERAE FROM HANDWASHINGS OF FAMILY CONTACTS AND WATER SAMPLES

Samples	Isolation of V. cholerae			
	Classical Group		El Tor Group	
	No. Samples	No. Isolation	No. Sample	No. Isolation
Handwashings:				
Family contacts	697	2[a]	703	15[b]
Water:				
Storage Container	207	1*	167	3
Tube Well	5	0	5	1
Pond/river/canal	124	7	61	7**

*The El Tor biotype was isolated from water container of families of classical cholera.

**2 out of 7 strains were classical biotype from water source of families of El Tor cholera.

Fisher exact test (2 tailed): a vs b $p<0.01$

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COMPARATIVE BEHAVIOUR OF CLASSICAL AND EL TOR BIOTYPES OF VIBRIO CHOLERAE O1 ISOLATED IN BANGLADESH DURING 1982

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Abstract

The change from classical to the El Tor biotype of Vibrio cholerae during the early seventies in Bangladesh remains to be elucidated. The shift in 1982 from El Tor back to the classical was not predicted, but provided an opportunity to study both the biotypes occurring simultaneously in nature, compared with earlier isolates. Comparative studies showed TCBS to be as good as TTGA for isolation of the two biotypes. Replacement of the El Tor by the classical biotype as the dominant epidemic strain, occurred over four months. Isolates of both biotypes from 1982 were found to be slow in mannitol fermentation. The isolates of El Tor were frankly haemolytic and belonged to phage type 4. The classical strains were of phage type 3. V. cholerae strains isolated in the late sixties and early seventies were similar in these amrkers. This suggested that the epidemic was caused by strains indigenous to Bangladesh. A classical strain of V. cholerae isolated in 1969 was overgrown by an El Tor strain of the same year when grown together in peptone water. Classical strains of 1982, however, grew competitively with 1969 and 1982 strains of El Tor. One classical isolate of 1982 survived for 50 days when grown with an El Tor strain of 1969. These findings suggest that the classical V. cholerae strains of 1982 successfully compete with the El Tor strain. They are more toxigenic than the prevailing El Tor biotype.

Key words: Vibrio cholerae; Cholera

Introduction

The El Tor biotype of Vibrio cholerae was first recognized as a causative agent of cholera in Bangladesh in 1968 (2). In 1973 it replaced the classical biotype. Despite the apparent absence of the classical biotype after 1973, this Centre continued regular biotyping of V. cholerae strains. In 1979 (11), 1980 and 1981, several strains of classical biotype were found with El Tor remaining dominant until August 1982. A case of cholera due to classical V. cholerae was

found on September 3, 1982. From then onwards, the isolation of this biotype increased and by the last week of December 1982, nearly 90% of the isolates were of the classical biotype.

The earlier shift from classical biotype to El Tor and the present return of classical cholera remain an enigma. The current change in biotype provided an unique opportunity to study simultaneously isolated strains of both biotypes, and compare them with strains of previous years to determine what gave the classical biotype the capacity to displace the El Tor biotype.

Materials and methods

Isolation and identification:

Freshly passed stool specimens collected in sterile glass containers, or obtained by rectal swabs placed in Carry and Blair transport medium, were transferred to the laboratory within an hour. Taurocholate tellurite gelatin (TTGA) agar (14) and Thiosulfate citrate bile salt sucrose (TCBS)

agar (13) plates were inoculated by swabbing the agar surface in a circular fashion over an area of ca. 3.75 cm in diameter. After inoculating the TTGA plate, the swab was rotated to expose a fresh side prior to inoculating a TCBS plate. The plates were then streaked with a wire loop to obtain isolated colonies. MacConkey and Salmonella Shigella agar plates were inoculated similarly to exclude other enteric bacteria. All the plates were incubated overnight at 37°C.

Suspect colonies of V. cholerae were inoculated into several media: Kligler iron agar, motility indole urea medium, Moeller's lysine and ornithine decarboxylases and the argine dihydrolase media, M-R V-P medium, peptone water containing 0 to 8% sodium chloride, and Andrade's peptone water which contained 1% mannitol, sucrose, arabinose or mannose. All the tests were done following the methods of Cowan and Steel (4). The colonies were also tested for agglutination with O-group 1 and monospecific Ogawa and Inaba antisera. Biotype differentiation was done by the modified tube haemolysis method (20) and agglutination of 2.5% chicken erythrocytes (8). Sensitivity to 50 U polymyxin B (17), classical group IV (15) and El Tor Group 5 (3) phages was also tested. Phage typing of the strains of classical and El Tor biotypes was done, following the methods of Mukerjee (14) and Basu and Mukerjee (3).

Growth of the classical and El Tor biotypes of Vibrio cholerae

To compare growth of the classical and El Tor strains isolated during the 1982 epidemic with that of the isolates obtained in earlier years, two strains of each biotype isolated in 1969 and 1982 were grown in overnight culture using T_1N_1 medium (Trypticase, 1%; sodium chloride,

and distilled 100 ml). The broth was diluted 10^{-4} with sterile peptone water and 1 ml amounts were added to 100 ml quantities of the same medium prepared in flasks. The inoculated flasks were incubated at 37°C. The plating of 10-fold dilutions of the cultures incubated for 0,2,4,6,8,10,12 and 24 hours was performed in duplicate on gelatin agar by spread plating and colony forming units (cfu) were recorded following overnight incubation.

Interaction between strains of Vibrio cholerae classical and El Tor biotypes in vitro:

To determine whether the classical and El Tor strains could be grown together in the same flask culture, two strains of each biotype isolated in 1969 and 1982 were selected for study. The El Tor strains were of the Ogawa, and the classical the Inaba serovars, respectively. Overnight growth of the strains of classical Inaba and El Tor Ogawa strains in T_1N_1 broth were diluted serially to 10^{-6} and 1 ml of each was added to 100 ml of peptone water and incubated at 37°C. Plating for viable counts was done at specific time intervals for 24 h. The viable counts were checked by using agglutination with monospecific antisera. In one experiment with a classical biotype of 1982 and El Tor biotype of 1969, this observation for survival was continued upto 50 days.

Lysogenicity:

Thirty strains, 15 of each biotype isolated during the current epidemic, were examined for lysogenic properties. The strains were grown in T_1N_1 broth for 5 h and then treated with chloroform. The supernate was diluted serially 10-fold to 1:100 and one loopful each of the original

and the diluted lysate was inoculated onto the middle of lawns of individual strains. The plates were incubated overnight at 37°C and the lawns observed for lysis or plaque formation by phage.

Toxigenicity:

Preparations of culture filtrates: Thirty-four strains, including one of each biotype were picked at random over the 17 week study period for toxigenicity testing. Five or six colonies were picked up following overnight growth on gelatin agar and inoculated into 10 ml of Richardson's medium (16) in 50 ml conical flasks and incubated overnight in a shaking water bath (120 oscillations/min) at 37°C. The cultures were centrifuged at 4°C for 30 min at 22,000xg. The supernates were passed through membrane filters of 0.22 µm average pore diameter and stored at 20°C.

Rabbit ileal loop test: This was done following the method of De and Chaterjee (6), as modified by Annapurna and Sanyal (1) and using the above culture filtrates. Physiological saline and culture filtrates of toxigenic V. cholerae strain 569B prepared simultaneously, served as negative and positive controls, respectively. All experiments were performed in triplicate.

Skin permeability factor (PF): This experiment was carried out following the methods of Craig (5), Dubey and Sanyal (7) using the above culture filtrates.

Titration of toxin in culture filtrates was done for nine and six strains of each biotype isolated during 1969-72 and 1979-82, respectively.

The culture filtrates were initially diluted to 1:20 and serially diluted 2-fold. To determine the titres, culture filtrates were diluted as required and tested again to measure the nearest end points (BD_4).

GM_1 ELISA and CHO cell assays: GM_1 ganglioside immunosorbent assay (20) and Chinese hamster ovarian cell assay (9) were done and using 34 culture filtrates prepared from strains of the 1982 set of isolates.

Results

A total of 4401 strains of V. cholerae O1 were isolated from September 3 to December 30, 1982 (Table I). The growth of the organisms was readily observed on TTGA and TCBS plates. Biotyping revealed that 2620 strains were of the classical and 1781 were of the El Tor biotype. Of the classical strains, 2617 were Inaba serovar and 3 Ogawa, whereas among the El Tor, 783 were Ogawa and 998 Inaba. A steady increase in the number of weekly isolations of classical strains was noted and by the first week of December, the eltor strains constituted less than 10% of the total isolations.

Biochemically, the strains that were isolated were identified as V. cholerae O1, but were late mannitol fermenters. The El Tor strains haemolysed sheep erythrocytes in tube, but the classical strains did not. The strains of both biotypes were of Heiberg group 1. The classical strains were phage type 3 and the El Tor type 4. A number of the El Tor strains were lysogenic, but none of the classical strains were positive for this characteristic.

No significant difference was observed between the growth curves for the classical and El Tor strains isolated in 1969 and 1982.

Preliminary studies of in vitro interactions between the classical and El Tor strains showed that, when grown together after inoculation with almost similar number of cells, both strains of the biotypes isolated in 1969 in Bangladesh grew rapidly upto 6 h, but the classical strain lagged by more than 1 log. By 8 h, the classical strain was completely overgrown by the El Tor (Table II). In contrast, the classical isolates from 1982 seem to grow together at about equal rates, with the El Tor isolates of 1969 and 1982 for upto 24 h of observation. In one experiment, where the duration of observation was extended upto 50 days, a classical isolate of 1982 survived equally well in the presence of an El Tor isolate from 1969.

All the strains tested for toxigenicity by rabbit loop, skin PF, CHO and GM_1 ELISA assays, were positive. The mean PF titres of the classical and El Tor strains isolated in 1969-72 and 1979-82, indicated that strains of the former biotype were more potent toxin producers (Table III). The differences were more obvious for the 1979-82 isolates.

Discussion

It may be recalled that 1968-72 was a transitional period, in the sense that the classical biotype was slowly replaced by El Tor. During 1979-82, especially since September 1982, the reverse has occurred.

No significant difference has been observed to date with respect to the growth rate of individual classical or El Tor strains isolated in 1969 and 1982. However, competitive growth studies show that the earlier El Tor biotype had a definite growth advantage over the entire classical biotype. Experiments carried out with the classical strains isolated in 1982 seem to indicate that the present classical biotype is different from those isolated in the sixties as it can survive with the El Tor biotype of 1969 and 1982. However, the anture of change in the emergent classical strains has not yet been identified.

The biochemical characteristics (19) and the phage types (21) of strains belonging to both the biotypes isolated during the current epidemic are similar to those of the earlier classical and El Tor strains. These observations suggest that they might have originated in Bangladesh.

The classical and El Tor strains isolated during the current epidemic were all toxigenic by the rabbit loop, skin PF, CHO cell culture and GM_1 ganglioside assays. Titration of toxin produced by both the biotypes indicated that under the same conditions of growth the classical strains of 1979-82 were stronger producers of toxin than those of the El Tor biotype of 1969-72 and 1979-82.

TCBS medium has been considered very useful for isolation of the El Tor biotype (11) and is widely used throughout the world. However, little is known regarding its efficacy in isolating strains of classical biotype. In the present study, we were able to isolate equal numbers of V. cholerae strains of both the biotypes from TTGA (12) and TCBS media, indicating that TCBS is equally efficient in isolating V. cholerae strains regardless of their biotype.

The 1982 cholera epidemic in Bangladesh was caused by the re-emergence of the classical biotype of V. cholerae. This new classical biotype is able to compete with the [illegible] and is more toxigenic in comparison to the prevailing [illegible] biotype and may be indigenous to Bangladesh. A continuous surveillance system based on the biotyping of V. cholerae strains to monitor shifts between biotypes in cholera in endemic regions is valuable for better understanding of epidemiology of the disease.

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Table I - Weekly isolations of Vibrio cholerae biotypes classical and El Tor from September 3 to December 30, 1982.

Weeks	Classical			El Tor		
	Ogawa	Inaba	Total	Ogawa	Inaba	Total
03 Sept.-09 Sept.	0	19	19	31	65	96
10 Sept.-16 Sept.	0	38	38	27	44	71
17 Sept.-23 Sept.	0	68	68	29	23	52
24 Sept.-30 Sept.	0	66	66	18	37	55
01 Oct. -07 Oct.	0	88	88	43	41	84
08 Oct. -14 Oct.	0	117	117	54	48	102
15 Oct. -21 Oct.	0	137	137	91	51	142
22 Oct. -28 Oct.	0	130	130	71	65	136
29 Oct. -04 Nov.	0	113	113	77	101	178
05 Nov. -11 Nov.	0	129	129	85	58	143
12 Nov. -18 Nov.	1	273	274	121	70	191
19 Nov. -25 Nov.	1	286	287	109	76	185
26 Nov. -02 Dec.	0	304	304	88	54	142
03 Dec. -09 Dec.	0	236	236	74	23	97
10 Dec. -16 Dec.	0	202	202	40	14	54
17 Dec. -23 Dec.	0	231	231	28	7	35
24 Dec.-30 Dec.	1	180	181	12	6	18
	3	2617	2620	998	783	1781

Table II - In vitro interaction between Vibrio cholerae biotypes classical and El Tor using isolates of 1969 and 1982

Hours	Colony forming units per ml					
	Classical (1969)	El Tor (1969)	Classical (1982)	El Tor (1982)	Classical (1982)	El Tor (1969)
0	0.6×10^{1}	0.7×10^{1}	1.9×10^{2}	9.0×10^{1}	9.0×10^{1}	1.1×10^{1}
4	1.0×10^{3}	3.9×10^{3}	4.9×10^{5}	1.3×10^{5}	3.2×10^{4}	2.1×10^{4}
6	3.0×10^{3}	3.8×10^{4}	ND [1]		ND	
8	0.0	1.3×10^{6}	4.0×10^{8}	5.5×10^{8}	7.2×10^{8}	4.1×10^{8}
12	0.0	1.5×10^{8}	1.7×10^{8}	6.0×10^{6}	8.0×10^{8}	6.0×10^{8}
24	0.0	1.5×10^{9}	4.0×10^{8}	2.3×10^{9}	9.5×10^{8}	1.2×10^{9}

1 ND: not done

Table III- Skin PF titres of Vibrio cholera : .otypes cl: sical and El Tor strains isolated duri: .)69-72 and)79-82.

Biotype	Isoaltion period	Number of stra :	Mean of PF titre (reciproca
Classical	1969-72	9	93.33
	1979-82	6	130.00
El Tor	1969-72	9	61.66
	1979-82	6	46.66

4/BT/June 83

DIRECTOR'S REPORT
- PROGRAMME COORDINATION COMMITTEE

DIRECTOR'REPORT

I am pleased to present an improved Annual Report for 1982 to the Board of Trustees. The intent was to communicate what we are doing more briefly with less scientific jargon to both technical but especially non-technical people. The editorial staff have done an excellent job digesting what came to them as technical material. An expanded financial report including most of the audit is incorporated as our participating countries and agencies frequently ask for this.

My introduction to the Annual Report 1982 serves as my Director's Report to the Board. I have little to add in this short statement except to inform you of events of importance since the end of 1982.

The first is to let you know that two of the approved candidates, Drs Ivan Ciznar and Bogdan Wojtyniak, will join our staff this summer or early fall thus strengthening immunology, demography and statistics. France has agreed to send several physicians to our Centre this year and World University Services of Canada is actively seeking people for us which will be supported by Canada. We have had an excellent response to our advertisements.

Our financial position is much improved and will be reported on in detail.

We have already had several very important publications out in 1983 and a partial list of these is available.

../2.

The first issue of the Journal of Diarrhoeal Diseases Research has gone to press and we have sufficient material now for three issues. We are currently having to turn down more than 50% of submissions.

A full team is in the field in Dammam, Saudi Arabia in our first major overseas project. I am also happy to report that the group we had worked with and supported in Kenya have been selected as one of five principal sites for Clinical Research by the WHO/CDD Programme; the ICDDR,B has been designated as the principal Clinical Research Training Centre by this Programme. We will hold a working meeting of the key scientific staff of all five Centres at Dhaka in November this year. The Centre will receive five years of core support from WHO to bolster this effort.

We have fully implemented the WHO Rules and pay scales.

The new hospital building is in full operation and the vacated space is being readied for accommodating our most cramped activities.

We are looking forward to the new scientific staff that will come from present recruitment to infuse added dimensions and enthusiasm into our work.

PROVISIONAL

06-06-1983

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C Annual Report:

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D Newsletter:

Glimpse. 1983 Jan-Feb; vol. 5, no. 1. 8p.

TO REVIEW THE FUNCTIONS OF THE PROGRAMME COORDINATION COMMITTEE (PCC) AND THE STANDING COMMITTEE (SC)

DIRECTOR'S REPORT IN REGARD TO PCC AND SC MEETINGS

The Board of Trustees in its meeting of December 1982 (Resolution No.11) constituted the PCC and its SC. Since then the SC has convened two meetings, first one on March 6,1983 and the second one on May 15, 1983. The PCC has held only one meeting on May 15,1983.

In the meeting of May 15,1983, the PCC has taken a number of decisions and formulated the operational guidelines both for PCC and the SC. The draft minutes and the operational guidelines are enclosed.

While considering the operational guideline for SC, it was felt that Bangladesh Medical Research Council (BMRC) should have a representative in the SC. PCC recommends that the number of SC members be 13 of which 10 members will be nominated by the Board of Trustees for a period of three years on the recommendation of the PCC and one member from BMRC (nominated by BMRC) along with two members nominated by the Government.

In view of the above, the Board of Trustees is requested to approve the following:

1. To approve the number of membership of the Standing Committee as 13 instead of 11.
2. To approve the membership of Bangladesh Medical Research Council (BMRC) Representative and Joint Secretary, Population Division in the existing Standing Committee set up by the resolution of Board meeting in December 1983.
3. To review the operational Guidelines of the PCC and SC.
4. To note the proceedings of the PCC on May 15,1983 and SC on March 6 and May 15,1983.

DRAFT

RESOLUTION / JUNE 1983

RESOLVED: On the basis of the recommendation of the Programme Coordination Committee (PCC) during its meeting of May 15, 1983, the Standing Committee (SC) of PCC consists of 13 members, as follows:

(a) i) 10 members to be recommended by the PCC,

ii) 1 member to be nominated by the BMRC,

iii) 2 members to be nominated by the Government.

(b) That the members of the SC may either be by name or designation as in case of PCC.

(c) That the Joint Secretary, Population Wing of Ministry of Health and Population Control be included as a member of the SC.

DRAFT

MINUTES OF THE FIRST MEETING OF PROGRAMME COORDINATION COMMITTEE (PCC) HELD ON 15 MAY 1983 IN THE AUDITORIUM OF IPH, AT 4 P.M.

Members present

1. Dr.A.K.M.Aminul Haque
2. Dr.Md.Ibrahim
3. Dr.Kamaluddin Ahmad
4. Prof. M.Mobarak Ali
5. Dr.Shafiqur Rahman
6. Mr.F.H.Abed
7. Dr.Monowara Binte-Rahman
8. Dr.A.K.M.Siddiq
9. Mr.Jalaluddin Ahmed
10. Prof.Nurul Islam
11. Dr.M.S.Akbar
12. Dr.M.H.Rahman
13. Dr.A.T.M.Hussain
14. Dr.M.R.Khan
15. Dr.Mofazzal Hossain
16. Dr.S.A.Akanda

Members present

17. Dr.A.K.Khan
18. Dr.A.H.M.Abdus Sattar
19. Prof. M.A.Matin
20. Mr.M.K.Anwar
21. Brig.M.R.Chowdhury
22. Dr.Hajera Mahtab
23. Dr.Farida Huq
24. Dr.Ghyasuddin Ahmed
25. Dr.Anwarul Azim Chowdhury
26. Dr.Abdur Rahman
27. Dr.Atiqur Rahman Khan
28. Dr.W.B.Greenough
29. Dr.K.M.S.Aziz
30. Dr.Stan D'Souza
31. Dr.A.R.Samadi

Members absent

1. Dr.K.M.Badruddoza
2. Dr.A.K.M.Shamsul Huq
3. Mrs. Gole Afroz Mahbub
4. Mr.R.J.Isherwood
5. Maj.Gen. M.Shamsul Haque
6. Dr.M.Mujibur Rahaman
7. Dr.Thomas C. Butler

Agenda-1: Election of President, Vice-President and Member-Secretary of Programme Coordination Committee (PCC) of ICDDR,B.

At the outset, Dr.Greenough,Director, ICDDR,B gave a brief background of the formation of Programme Coordination Committee (PCC) and Standing Committee (SC). Dr.Aziz of ICDDR,B also informed the members present, of the informal discussion among the members of the SC that the President, Vice-President and Member-Secretary of SC may be the same for PCC for

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efficient operation and coordination between these two committees. Thereafter, Dr.Greenough requested the house to elect the President of the Committee. Prof. M.A.Matin, Member, Board of Trustees was proposed, seconded and unanimously elected as President of PCC. Dr.Greenough then requested Prof. M.A.Matin to take the Chair.

Thereafter, the President called for the election of Vice-President and Member-Secretary. Mr.M.K.Anwar, Member of Board of Trustees was proposed, seconded and unanimously elected as Vice-President of PCC. Mr. Anwar accepted this election and with the permission of the Chair, expressed his opinion that the post of Vice-President should go to a person who is not a member of the Board of Trustees, and suggested election of another person in his place. The President appreciated and accepted his views and requested the house to elect the Vice-President. Accordingly, Prof. Kamaluddin Ahmad was proposed, seconded and unanimously elected as Vice-President of PCC. The house, thereafter, proposed, seconded and unanimously elected Dr.K.M.S.Aziz as the Member-Secretary of PCC.

Agenda-2: Consider the minutes of the meeting of Standing Committee (SC) held on 6th March 1983 and 15th May 1983.

The minutes of the meeting of SC dated 6 March 1983 and 15 May 1983 were circulated in the meeting. The President requested the Member-Secretary to read out the minutes and accordingly the Member-Secretary read out the minutes of SC dated 6 March 1983 and 15 May 1983. Members of PCC noted the same and started discussion on the basis of these minutes for the subjects in the next agenda item.

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Agenda-3: Discuss the draft proposal for operational guidelines both for SC and PCC.

(a) On the basis of the discussions, the house decided to recommend to the Board of Trustees that SC should consist of 13 members, as follows:

i) 10 members to be recommended by the PCC

ii) 1 member to be nominated by the BMRC

iii) 2 members to be nominated by the Government

(b) PCC will recommend 10 members either by name or by designation. The PCC further noted that the members of SC as noted in the Board of Trustees resolution are members by name and will serve in their individual capacity.

(c) The PCC approved the draft operational guidelines both for SC and PCC with modification which have been incorporated and attached as per Annexure 'A' and 'B'.

(d) As per Annexure 'A' recommendations, the PCC recommends that the Joint Secretary, Population Wing of Ministry of Health and Population Control be a member of the SC.

Agenda-4: Review the list of all ongoing protocols of ICDDR,B.

The list of ongoing protocols were circulated in the meeting for kind perusal of the members. The President requested the members to go through the list and bring up their considered opinion in the next meeting.

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Agenda-5: Evaluation of activities of National Oral Rehydration Programme (NORP).

Dr.Mofazzal Hossain briefed the committee on the need for proper evaluation of NORP. Dr.Greenough emphasized that ICDDR,B would like to do whatever it could for this evaluation. ICDDR,B and NORP will sit together and find out the bottlenecks so that a proper evaluation can be done.

Agenda-6: Miscellaneous.

(a) Dr.Kamaluddin Ahmad asked to strengthen NORP and requested ICDDR,B to take up the matter of the epidemic of diarrhoeal disease and concentrate on the areas of direct relevance to ICDDR,B objectives. Dr.Greenough welcomed the statement and mentioned that ICDDR,B cannot do the job alone and asked national institutions to take up more activities.

(b) Prof. Nurul Islam emphasized the need of national programmes for dessemination of information, which may help us to combat the incidence of diarrhoeal disease in epidemic form.

(c) Dr.Md.Ibrahim invited ICDDR,B to join the Government efforts of Primary Health Care and expressed his opinion that ICDDR,B should actively join the Training Activities of Primary Health Care Programme of the Government of Bangladesh.

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(d) Dr.K.M.S.Aziz referred to the "Tentative List of ICDDR,B Collaborative Efforts with National Institutions", which were circulated in the meeting and invited any addition or suggestions from PCC members.

The President thanked the members for their cooperation and closed the first meeting of the PCC. The meeting was closed at 6.30 p.m. with a vote of thanks to the chair.

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MINUTES OF THE FIRST MEETING OF THE STANDING COMMITTEE (SC) HELD ON MARCH 6, 1983 IN THE TRAINING LECTURE ROOM AT 3:00 P.M.

MEMBERS PRESENT:

Dr. Kamaluddin Ahmed
Dr. K.M.S. Aziz
Dr. M.R. Chowdhury
Dr. W.B. Greenough
Dr. A.K. Khan
Dr. M.A. Matin
Mrs. Gole Afroz Mahbub
Dr. A.K.M. Aminul Haque
Dr. Mofazzal Hossain

MEMBERS ABSENT:

Two (waiting for government nomination).

CHAIRMAN:

The meeting started under the Chairmanship of Dr. M.A. Matin, who was the Chairman of the Steering Committee, responsible for the recommendation of the formation of the Standing Committee.

It was proposed that following this meeting, Programme Coordination Committee meeting should be held and should spell out the operating guidelines of both the Committees (PCC & SC).

The resolutions of the Board, in full, were circulated to all members present.

Dr. M.A. Matin, Dr. Kamaluddin Ahmed and Dr. K.M.S. Aziz were elected unanimously as President, Vice President and Secretary of the Standing Committee.

Item no. 3 of the circulated Agenda dated February 3, 1983: "Discussion on the proposed collaborative programme between ICDDR,B and BMRC (Attachment No. 1)" was taken as Agenda No. 1 and the rest of the agenda items were accepted with re-numbering.

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AGENDA 1 : Discussion on the proposed collaborative programme between ICDDR,B and BMRC (Attachment No. 1).

Dr. A.K. Khan described the process so far and a document was circulated which has been submitted to BMRC. It was also noted that a sum of $10,000 were committed to this cell from ICDDR,B Core funds for the first year.

It was noted that the document will be finalized in the next meeting of the BMRC. Final decision in this regard will be taken by Standing Committee in a subsequent meeting.

AGENDA 2 : Initiation of research protocols by National Institutions and procedure for securing funds (including discussion on USAID Program for Science and Technology Cooperation (PSTC) as a source of funds (Attachment No. 2).

In addition to the already circulated attachment no. 2, a document no. ICP BSM 001.003 dated January 24, 1983 was circulated. Dr. W.B. Greenough explained the possible ways funds could be secured. It was resolved that these two documents be circulated to all members of the PCC to share with the Scientists of these organizations for awareness of the Scientists and for application for research grants from USAID and WHO. It was also noted that the investigators could receive additional remuneration from research protocol.

AGENDA 3 : Briefing on the procedures for preparation and review of protocols in ICDDR,B.

Dr. K.M.S. Aziz described the process of review of protocols through the Research Review Committee and Ethical Review Committee. Dr. Greenough also mentioned that this is a process of strengthening research proposals for external funding.

AGENDA 4 : Steps to be taken to prepare a running invertory of work done in the field of diarrhoeal diseases and related subjects.

One method of preparation of inventory is to get an inventory and then get additional input from National Library of Medicine Documentation Centre & BANSDOC. DISC in ICDDR,B should be asked to undertake the inventory for what is going on in Bangladesh.

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AGENDA 5 : Review of the list of ongoing and approved protocols of ICDDR,B for forwarding to the Programme Coordination Committee (Attachment No. 3).

This attachment (≠≠ 3), the list of ongoing and approved protocols is to be circulated to all the members of the PCC.

AGENDA 6 : Nomination of one of the members of the Standing Committee for membership in the Research Review Committee and the Ethical Review Committee as per Board of Trustees resolution No. 13/Dec.'82(11).

The name of Brig. M.R. Chowdhury was proposed, seconded and unanimously approved as a member of Research Review Committee.

The name of Dr. Kamaluddin Ahmed was proposed, seconded and unanimously approved as a member of Ethical Review Committee.

AGENDA 7 : Discussion on the letter of Professor Hefazuddin Shaikh of Bangladesh Agricultural University (Attachment No. 4).

The Chairman read out the letter of Prof. Hefazuddin Shaikh. Dr. A.K.M. Aminul Haque explained further the provisions of the ordinance of the Bangladesh Agricultural University in this connection. ICDDR,B has to write to BAU for recognition.

This proposal (attachment no. 4) is sent to the Management of the Centre to determine whether ICDDR,B will take this up with BAU.

AGENDA 8 : Current status of ICDDR,B collaboration with national institutions.

A tentative list of collaborative activities, both in research and training, was circulated. This list is to be updated and a draft list is to be circulated to the PCC members for any further addition so that members of PCC will be prepared for discussion in the PCC meeting.

The 'nature of works' column is to give more details about each of the activities listed.

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AGENDA 9 : **Proposals for agenda items for the next Standing Committee meeting.**

The Secretary is requested to write, 3-4 weeks ahead of the meeting, to all members asking for proposed agenda items.

The next Standing Committee should meet in the middle of May, 1983.

Programme Coordination Committee (PCC) will meet following the SC meeting on the same day.

AGENDA 10 : Miscellaneous (Honorarium for PCC members).

It was noted that the number of PCC members, external to ICDDR,B, would not be exceeding the number of 35.

The members of PCC and SC will receive an honorarium of Tk. 600/= per meeting. However, when the two Committees will meet on the same day, it will be considered as one meeting only.

The meeting was adjourned with thanks to the Chair at 5:30 p.m.

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RESOLUTION 12/DEC. 82

RESOLVED: The Programme Coordination Committee of the following composition be established:

Ex-officio members -

1. Vice Chancellor, Bangladesh Agricultural University
2. President, BIRDEM
3. Director, Institute of Nutrition and Food Science
4. Chairman, BARC
5. Director, NIPSOM
6. Director, BFRP
7. Executive Director, Bangladesh Rural Advancement Committee
8. Chairman, BCSIR
9. Director, Institute of Public Health
10. Vice Chancellor, Dhaka University
11. Director, NIPORT
12. Director, MIS
13. Director, IPGM&R
14. Director, Shishu Hospital
15. Director, Children's Nutrition Unit (Save the Children Fund)
16. Director, IPHN
17. Principal, Paramedical Institute
18. Chairman, BIDS
19. Project Director, National Oral Rehydration Project
20. Director, IBS, Rajshahi
21. Director, BMRC

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22. Representatives from the Board of Trustees, Director, Program Heads, including Associate Director, Training and Extension of ICDDR,B.

Individual Members:-

1. Dr (Brig) M.R. Chowdhury, CMH
2. Dr Hajera Mahtab, BIRDEM
3. Dr Farida Huq, IPH
4. Dr Ghyasuddin Ahmed, NIPSOM
5. Dr Anwarul Azim Chowdhury, Microbiology Dept., Dhaka University

Further individuals may be co-opted at the discretion of the Programme Coordination Committee.

An 11-member Standing Committee is recommended as follows:-

1. Dr Kamaluddin Ahmed, INFS
2. Mrs Gola Afroz Mahbub, ~~BIRDEM~~ MIS
3. Dr A.K. Khan, BMRC
4. Director, NORP
5. Dr A.K.M. Aminul Haque, BAU, Mymensingh
6. Dr (Brig) M.R. Chowdhury, ~~CMH~~ AFIP+T
7. Director, ICDDR,B
8. Dr M.A. Matin (Trustee member)
9. Dr K.M.S. Aziz, ICDDR,B (Chairman, RRC)
10 & 11 Government Nominations

RESOLUTION 13/DEC. 82

RESOLVED: The Board approves the following By-laws of the Programme Coordination Committee (PCC):

(1) There would be a bigger body to be named as a PCC to meet at least twice a year and a smaller body a Standing Committee which shall meet at least once a quarter of the year.

(2) The heads of organizations engaged in research in the relevant fields would be members of the PCC. Membership of the Committee may be in the individual capacity or ex-officio. A head of an organization can permanently nominate a suitable senior person from that institution to become a member of PCC. Individual members shall be appointed for three years.

(3) The Standing Committee with representatives of the Government would be formed by the Board of Trustees on recommendation of the PCC. There would be 11 members in the Standing Committee inclusive of 2 representative of the Government.

(4) A running inventory of the work done in this field (diarrhoeal diseases and related subjects) and of workers in Bangladesh would be prepared by the Standing Committee and presented to the PCC.

(5) The PCC shall identify overlaps between the work of the Centre and other organizations in the field of diarrhoeal diseases and related subjects.

(6) The PCC shall discuss and offer to mediate any inter-institutional controversy regarding undesirable overlaps and competition in diarrhoeal diseases and related subjects.

(7) The PCC shall be supportive on request of national institutions in preparation of research protocols, training and in securing funds for approved research protocols, in addition to providing Centre's facilities for carrying out research as feasible. (Protocols approved by PCC or its Standing Committee. The Standing Committee will be responsible for

scrutinizing such protocols either by itself or by any other suitable committee(s).

(8) The Research Review Committee of ICDDR,B on approval of ICDDR,B protocols shall forward the approved protocol to PCC, so that the Committee can identify and report to the Board actions prejudicial to the interest of research in similar fields carried out by other organizations in Bangladesh.

(9) The nominated members from the Government to the Standing Committee will also be members of the PCC.

(10) At least 1/3 members of the Committee (Standing and PCC) will form a quorum for the meeting. There would be 15 days notice for PCC and 7 days notice for Standing Committee.

(11) The Standing Committee will nominate one of its members to ICDDR,B, namely Research Review Committee and Ethical Review Committee, for better coordination between these 3 Committees.

DRAFT PROPOSAL ON OPERATIONAL GUIDELINES FOR PROGRAMME COORDINATION COMMITTEE (PCC) OF ICDDR,B

In pursuance of the decision of the Board of Trustees of ICDDR, vide resolution No. 13 of December 1982, the following guidelines are laid down for better understanding and working of the Programme Coordination Committee (PCC) of ICDDR,B:

1. Membership of the Committee:

Membership of the PCC shall consist of the following:-

a) Ex-officio members from different organizations,

b) There may be individual members,

c) The SC members including the nominated members will be members of the PCC.

d) ICDDR,B internal members:

i) Bangladesh members of the Board of Trustees

ii) Director (Ex-officio)

iii) Associate Director, Training & Extension of ICDDR,B (Ex-officio)

iv) Programme Heads (Ex-officio).

e) Further individuals may be co-opted at the discretion of the Programme Coordination Committee (PCC), subject to the condition that the non-ICDDR,B members should not normally exceed 35 (thirty-five).

2. Duration of Membership:

a) Ex-officio members will remain so long as the institution is represented in the Programme Coordination Committee (PCC). A head of an organization can nominate a suitable senior person from his institution to act as a member of the PCC, in case of his inability to accept the membership of the PCC. Such membership will be valid so long the nominated persons remain with the institution and subject to the condition that the head of the institution retain the right to renominate him, nominate some other person of his institution or he himself wish to be a member of the PCC, when the Programme

Coordination Committee is reconstitited. In case, a head of an institution cannot attend a particular meeting of the PCC due to official preoccupation he may nominate a senior person of his institution for that particular meeting. For this prupose prior official intimation will be required.

b) Individual members shall be appointed for a period of 3 (three) years by the Board of Trustees of ICDDR,B and they shall hold office from January following the decision by the board meeting in June, when the board reconstitutes the PCC.

c) ICDDR,B internal members, by designation, are permanent in nature.

d) Membership of organizations will be decided by the Board of Trustees of ICDDR,B and will be reconstituted every 3 (three) years.

3. President, Vice-President and Member-Secretary of PCC

a) The President of the PCC will be elected from among the members of the Board of Trustees.

b) If the President remains absent during a scheduled meeting of PCC, Vice-President will preside over the meeting. In case, the Member-Secretary remains absent he may designate a member of the PCC during his absence, to act as Member-Secretary. In case both the President and Vice-President are absent, the members present will elect a President for that meeting.

4. Meetings

a) The Programme Coordination Committee (PCC) shall meet at least twice in a year. The meetings will be convened by the Member-Secretary of the Committee in consultation with the President of the Committee, with at least 15 (fifteen) days notice.

b) The notice for the meeting should indicate the items of agenda, time, date and venue of the meeting and sent to the members through Peon Book or by registered post, to the last known address of the members.

c) The Member-Secretary shall invite items of agenda from the members of the committee at least 4 (four) weeks prior to the scheduled date of meeting.

d) The quorum of the meeting shall require presence of 1/3rd members of the committee.

5. Terms of reference of the Committee

The Programme Coordination Committee (PCC) shall act as advisory body to the Board of Trustees of ICDDR,B with regard to research works in the field of diarrhoeal disease and related subjects and ensure the following:

a) To identify the undesirable overlaps between the work of the Centre and other organizations involved in research in the aforesaid fields.

b) To act as referee and mediate any inter-institutional controversy regarding undesirable overlaps and competition in diarrhoeal disease and related subjects.

c) To evolve a central mechanism for conducting research in the field.

d) To maintain a running inventory of the work done in the field of diarrhoeal disease and related subjects, both by ICDDR,B and outside institutions in Bangladesh. Similarly, inventory of the relevant Scientific personnel working in those institutions should also be maintained.

e) To support the national institutions in preparing research protocols and in securing funds for the approved research protocols and provide Centre's facilities for carrying out such research works, as feasible.

f) To consider - any other related subjects/responsibilities assigned by the Board of Trustees of ICDDR,B.

DRAFT PROPOSAL ON OPERATION GUIDELINES FOR STANDING COMMITTEE OF PROGRAMME COORDINATION COMMITTEE OF ICDDR,B

In pursuance of the decision of the Board of Trustees of ICDDR,B vide resolution No.13 of December 1982, the following guidelines are laid down for better understanding and working of the Standing Committee (SC):

1. MEMBERSHIP OF THE COMMITTEE: Membership of the Standing Committee (SC) shall consist of 13 members, 10 members will be nominated by the Board of Trustees for a period of 3 years on the recommendation of PCC and one member from BMRC along with two members nominated by the Government.

2. DURATION OF MEMBERSHIP: The members of the SC selected by the Board of Trustees of ICDDR,B will serve a term of 3 years and accordingly, the present members of the SC shall continue in office for a period of 3 years beginning January 1983. The membership will be on an individual basis (by name), or by designation as indicated.

The Board will reconstitute the SC every 3 years during its June meeting and start functioning with effect from the 1st of January next year. The old SC will continue to function until the new SC is constituted by the Board.

3. MEETINGS:

(a) The SC shall meet at least once a quarter of the year and meeting may be convened by the Member-Secretary of the Committee in consultation with the President, SC, with at least 7(seven) days notice.

(b) The Member-Secretary shall invite items of agenda from the members of the Committee at least 3(three) weeks prior to the date of scheduled meeting.

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(c) The notice for the meeting shall indicate the items of agenda, time, date and venue of the meeting and be sent to the members of the Committee through Peon Book or by registered post, to the last known address of the members.

The members may however propose for inclusion of any important issues as additional agenda item in the beginning of the meeting.

(d) The quorum of the meeting shall require presence of 1/3rd members of the Committee.

4. TERMS OF REFERENCE OF THE COMMITTEE: The SC shall be responsible for the following:-

(a) Receive report/comments from the Research Review Committee of ICDDR,B with regard to both ongoing protocols and new protocols for diarrhoeal disease and related subjects.

(b) Compilation of reports/comments in respect of (a) above and submit the same to the PCC for information and necessary action.

(c) To receive research protocols from outside organizations/ individuals (other than ICDDR,B) and submit the same to the PCC with recommendations including the source of fund, where such protocols have been approved by the RRC and ERC but have not received funds.

(d) To prepare and update, from time to time, a running inventory of the work done in the field of diarrhoeal disease and related subjects, both by ICDDR,B and other organizations in Bangladesh. Similarly, inventory of scientific personnel working in those institutions should be maintained.

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(e) To review and encourage collaborative research, training and service activities.

(f) To discuss agenda items accepted by the SC.

(g) Any other responsibilities assigned by the Programme Coordination Committee (PCC), from time to time.

5. Any casual vacancy will be notified to the Board and the Board will take appropriate steps.

[*Published in the Bangladesh Gazette, Extraordinary, dated the 9th December 1978.*]

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

MINISTRY OF LAW AND PARLIAMENTARY AFFAIRS

NOTIFICATION

Dacca, the 9th December, 1978.

No. 920-Pub.—The following Ordinance made by the President of the People's Republic of Bangladesh, on the 6th December, 1978, is hereby published for general information :—

INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH ORDINANCE, 1978.

Ordinance No. LI of 1978.

AN

ORDINANCE

to provide for the establishment of an International Centre for Diarrhoeal Disease Research, Bangladesh.

WHEREAS it is expedient to provide for the establishment of an international centre for diarrhoeal research in Bangladesh with multinational scientific collaboration and financial contributions to conduct research in diarrhoeal diseases and directly related subjects of nutrition and fertility with special relevance to developing countries and for matters ancillary thereto;

NOW, THEREFORE, in pursuance of the Proclamations of the 20th August, 1975, and the 8th November, 1975, and in exercise of all powers enabling him in that behalf, the President is pleased to make and promulgate the following Ordinance:—

1. **Short title and Duration.**—(*1*) This Ordinance may be called the International Centre for Diarrhoeal Disease Research, Bangladesh.

(*2*) It shall continue in force for a period of 25 years.

Price: 35 paisa.

2. **Definitions.**—In this Ordinance, unless there is anything repugnant in the subject or context,—

(*a*) "Board" means the Board of Trustees for the Centre constituted under section 8;

(*b*) "Centre" means the International Centre for Diarrhoeal Disease Research, Bangladesh established under section 3;

(*c*) "Chairman" means the Chairman of the Board;

(*d*) "Cholera Research Laboratory" means the Cholera Research Laboratory established in Bangladesh under an agreement executed on 15th May, 1974, between the Government of the People's Republic of Bangladesh and the Government of the United States of America and others;

(*e*) "developing countries" mean those countries who have been put under this classification by the United Nations;

(*f*) "Director" means Director of the Centre;

(*g*) "donor" means an agency, organization, or government which contributes in cash or kind to the Centre;

(*h*) "employee" includes regular, contractual and probationers employed by the Centre;

(*i*) "member" means a member of the Board;

(*j*) "officer" includes advisor, consultant and expert employed by the Centre;

(*k*) "prescribed" means prescribed by by-laws made under this Ordinance.

3. **Establishment and Incorporation of the Centre.**—(*1*) There shall be an international centre to be called the "International Centre for Diarrhoeal Disease Research, Bangladesh" for carrying out the purposes of this Ordinance.

(*2*) The Centre shall be a body corporate having perpetual succession and common seal with power, subject to the provisions of this Ordinance, to acquire, hold and dispose of property, both movable and immovable, and shall by the said name sue and be sued.

(*3*) The Centre shall be an autonomous, international, philanthropic, and non-profit centre for research, education and training as well as clinical service.

4. **Headquarters of the Centre.**—(*1*) The Headquarters of the Centre shall be at Dacca.

(*2*) The Centre may establish such subsidiary offices of research stations as may be decided by the Board as being necessary for effective conduct of its programme subject to the approval of the respective governments.

5. Aims and objectives of the Centre.—(*1*) The aims and objectives of the Centre shall be:

(*a*) To function as an institution to undertake and promote study, research and dissemination of knowledge in diarrhoeal diseases and directly related subjects of nutrition and fertility with a view to developing improved methods of health care and for the prevention and control of diarrhoeal diseases and improvement of public health programmes with special relevance to developing countries.

(*b*) To provide facilities for training to Bangladeshi and other nationals in areas of the Centre's competence in collaboration with national and international institutions, but not to include conferring of academic degrees.

(*2*) In fulfilling the above aims and objectives, the Centre shall have responsibilities:

(*a*) To conduct clinical research, laboratory and animal experiments, epidemiological and survey research, field investigations, demonstration projects, within the applicable laws and regulations, or concurrence where necessary, of the Government and other countries where it may be appropriate; to hold meetings and to arrange lectures, seminars, discussions and conferences, both international and national, on clinical medicine, epidemiology, basic medical sciences, bio-statistics demography, fertility and other social sciences relating to studies of diarrhoeal disease control and public health, in this section referred to as the studies.

(*b*) To publish books, periodicals, reports and research and working papers on the studies.

(*c*) To establish and maintain contact with scholars and their work on the studies through collaborative studies, seminars, exchange of visits or otherwise.

(*d*) To undertake studies on behalf of or in collaboration with other institutions.

(*e*) To maintain hospitals, clinics, laboratories, animal research facilities, libraries, reading rooms, scientific equipment and instruments, as well as vehicles, boats and other transport for its proper functioning.

(*f*) To ensure the rights and opportunities of Bangladesh scientific personnel to participate in the programme and activities of the Centre.

(*g*) To undertake a systematic staff development programme.

(*h*) To institute fellowships for different categories of professional workers on the studies.

(*i*) To create within itself, from time to time, branches, divisions, sections and other units for proper and efficient conduct of the activities of the Centre in different fields of the studies.

(*j*) To accept endowments, gifts, donations, grants, other funds, payments for services and to earn income.

(*k*) To take such other actions as may further the aims and objectives of the Centre.

6. **Interim International Committee.**—(*1*) There shall be an Interim International Committee for the purpose of assisting in the establishment of the Centre. The Interim Committee shall consist of the United Nations Development Programme which shall be its Chairman and the following initial members, namely:—

(*a*) the Government of Australia;

(*b*) the Government of Bangladesh;

(*c*) the Government of the United Kingdom;

(*d*) the Government of the United States of America;

(*e*) the Ford Foundation;

(*f*) the International Development Research Centre;

(*g*) the United Nations Fund for Population Activities;

(*h*) the United Nations Children Fund; and

(*i*) the World Health Organisation.

(*2*) The Chairman of the Interim Committee may invite any other Government or Organisation to become members of the Interim Committee or to attend its meeting as observers.

(*3*) The Interim Committee shall function through the representatives of its members. It shall meet at the call of the Chairman and shall conduct its business at such meeting. The decision of a meeting shall be taken either by consensus or by a majority of votes of the members present and voting, including the Chairman, each member having one vote. Majority of the members of the Interim Committee including its Chairman shall constitute a quorum. Subject to these provisions, the business of the Interim Committee shall be regulated by the rules of procedure adopted by it.

(*4*) Unless otherwise decided by the Interim Committee the Secretariat of the Interim Committee shall be located in the premises of the Cholera Research Laboratory.

(*5*) The Interim Committee shall take steps for the establishment of the Board. For this purpose it shall elect not less than seven nor more than eleven members for the first Board to be constituted under this Ordinance. It shall also specify the date on which the first Board shall assume its functions under this Ordinance.

(*6*) The Interim Committee shall stand dissolved on the day on which the Board holds its first meeting, unless the Board by a Resolution continues the existence of the Interim Committee for such period and for the purpose as may be specified in the Resolution.

7. **Powers and Functions of the Board.**—(*1*) The general direction, management and administration of the affairs of the Centre shall vest in the Board which shall have full authority to determine and execute the policies and undertakings of the Centre within the framework of this Ordinance.

(2) Without prejudice to the generality of the foregoing provisions, the Board shall, in particular, have power—

(a) to exercise general supervision over the affairs of the Centre;

(b) to approve courses of studies and research work and other related activities to be conducted in the Centre in broad outlines;

(c) to approve the plan, programme and organisation of the Centre;

(d) to authorize the Centre to request and receive grants-in-aid from aid-giving agencies, Governments and other institutions; with intimation of such receipts to appropriate governmental agencies;

(e) to authorize the Centre, if and when necessary, to borrow money or raise loans in accordance with the applicable laws and regulations of the countries in which the funds are being sought;

(f) to select and appoint the Director and terminate his services;

(g) to approve establishment of all international level positions in the Centre and approve the appointments of persons to these positions, and in its description, delegate to the Director authority to appoint persons to other staff positions;

(h) to determine employment policies and practices of the Centre;

(i) to examine and approve the budget for the Centre; and

(j) to do and perform all other acts that may be considered necessary, suitable and proper for the attainment of any or all of the purposes, activities and objectives for which the Centre is established.

8. **Constitution of the Board.**—(1) The Board shall consist of sixteen members who shall serve in their individual capacity as follows:—

(a) three members nominated by the Government;

(b) a member nominated by the Director-General of the World Health Organisation;

(c) the Director of the Centre; and

(d) eleven members at large, who shall be chosen initially by the Interim Committee, comprising as members of the Interim Committee those governments and organizations under sub-sections (1) and (2) of section 6;

(2) At any given time, no country shall have more than two members except for Bangladesh under sub-section (1).

(3) At any given time, the Board shall be so composed that, not counting the members nominated by the World Health Organisation, more than 50% must come from the developing countries, including the members nominated by Bangladesh, and not less than one-third from developed countries. The Director shall be counted as coming from the developed or developing countries depending upon nationality.

(4) The members shall be individuals qulified to serve by reason of scientific, research, administrative or other appropriate experience.

(*5*) Except for the Director, all members shall be appointed to fill three-year terms, except for members of the initial Board. In the initial Board, all members except the Director shall be divided into three classes of approximately equal numbers, these classes serving terms of one, two and three years respectively. The Board shall decide how many members shall be in each class, and the members of each class shall be chosen by lot.

(*6*) Vacancies in seats of members at large shall be filled by the Board. A member appointed to a vacancy arising from a cause other than the normal expiration of a term shall serve for the remainder of the term of the member being replaced. No member may serve more than two consecutive three-year terms or portion thereof, except that a member serving a term of less than three years on the initial Board may serve two consecutive three-year terms immediately thereafter.

9. **The Chairman.**—(*1*) The members shall elect one of them except the Director as Chairman for a term to be determined by the Board.

(*2*) The Chairman shall preside over the Board meetings.

(*3*) In the absence of the Chairman, the members present may appoint one of them as the Chairman for that meeting.

10. **Meetings of the Board.**—(*1*) The meetings of the Board shall be held at such time, place and manner as may be prescribed. A majority of the sitting membership shall constitute a quorum.

(*2*) Except for the first year, at least two mettings of the Board shall be held in one calendar year.

(*3*) In the meeting of the Board, each member shall have one vote, but in the event of equality of votes, the Chairman shall have the second or casting vote.

11. **Validity of Proceedings.**—(*1*) No act or proceedings of the Board shall be invalid merely on the grounds of the existence of any vacancy in or defect in the constitution of the Board. A vacancy in the Board or a temporary absence of a member for any reason shall not impair the right of the remaining members to act.

(*2*) All acts done by a person acting in good faith as the Chairman or member shall be valid, notwithstanding that it may afterwards be discovered that his appointment was invalid by reason of any defect or disqualification or had terminated by virtue of any provision of law for the same being in force; but nothing in this section shall be deemed to give validity to any act of the Chairman, member or Director after his appointment has been shown to be invalid or to have been terminated.

12. **Committees.**—(*1*) The Board may designate an Exceutive Committee of its members who shall have the power to act for the Board in the interim between Board meetings on all matters which the Board delegates to it. The Director and at least one of the Bangladeshi members shall serve as members of the Executive Committee.

(*2*) All interim actions of the Executive Committee shall be reported to the Board at its next subsequent meeting.

(*3*) The Board shall convene, at least once in two years, an external Scientific Review Committee from developing and developed countries of such numbers as the Board may decide for the purpose of carrying out a technical review of the scientific programmes of the Centre.

(*4*) The Board shall create a Programme Co-ordination Committee for the purpose of co-ordination of research in Bangladesh and may create such other standing committees or *ad hoc* committees as may be deemed necessary for carrying out the responsibilities of the Centre. The Centre shall be supportive of, and avoid actions prejudical to, the interest of research in similar fields carried out by other organizations in Bangladesh. A standing committee with representatives from the Government shall be set up for the purpose of co-ordinating research by the Centre with that of other organizations specifically in fertility and related fields in Bangladesh.

(*5*) The Board shall authorize the creation of an Ethical Review Committee with representation from the Bangladesh Medical Research Council.

(*6*) The Board may delegate its functions and powers to such committees as may be prescribed.

(*7*) The powers, functions and duties of different committees shall be such as may be prescribed.

13. **Director.**—(*1*) The Centre shall be administered by a Director who shall be selected and appointed by the Board for a term of three years which may be renewable for another term.

(*2*) The Director shall be the Chief executive of the Centre and subject to the provisions of this Ordinance, and the by-laws made thereunder, he shall administer and manage the affairs and funds of the Centre.

(*3*) The Director shall be responsible for implementation of the decisions of the Board in directing, conducting and carrying out research and other activities of the Centre.

(*4*) The Director may be assisted by a Deputy Director who shall be selected and appointed by the Board, in all matters assigned to him by the Director and shall act as the Director during the Director's absence, serving as a member of the Executive Committee but not assuming the seat of the Director on the Board.

14. **Salaries, etc.**—(*1*) Persons including Bangladeshi nationals appointed to the international level positions of the Centre by the Board shall receive the same privileges and salaries for equivalent positions; restrictions on pay and allowances imposed by the Government upon its nationals shall not be applicable.

(*2*) Salaries and emoluments of non-international level positions should be comparable to those paid by the United Nations organizations in Bangladesh.

15. **Indemnity.**—The Chairman, members, Director, officers and employees shall be indemnified by the Centre against all losses and expenses incurred by them in or in relation to the discharge of their duties, except such as have been caused by their wilful act of default or negligence.

16. **Public Servant.**—The Chairman, members, Director, officers and employees shall while acting or purporting to act in pursuance of any provision of this Ordinance or by-laws made thereunder, be deemed to be a public servant within the meaning of section 21 of the Penal Code (Act XLV of 1860).

17. **Fund.**—(*1*) The Centre shall have its own fund which shall consist of—

(*a*) grants made by the Government;

(*b*) grants and contributions from other governments and their agencies, international organizations and private organizations;

(*c*) gifts and endowments;

(*d*) sale proceeds and royalties of publications;

(*e*) income from research and contractual undertakings; and

(*f*) other sources.

(*2*) All funds of the Centre shall ordinarily be kept in any nationalized Bank or Banks in Bangladesh as approved by the Board.

18. **Accounts of Receipts and Expenditure.**—(*1*) The Director shall maintain the accounts of all receipts and expenditures of the Centre in the manner as may be prescribed and such accounts shall be audited annually by Chartered Accountants as may be appointed by the Board in this behalf, a report of which shall be submitted to the Board.

(*2*) Copies of such audited reports shall be supplied to the donors.

19. **Annual Report and Statement of Accounts.**—The Director shall, as soon after the end of every financial year as may be directed by the Board, prepare for the Board an annual report of the working of the Centre and a statement of receipts and expenditure of the Centre. Following the approval by the Board it shall be circulated to the donors.

20. **Exemption from Labour Laws.**—(*1*) The Centre shall be exempted from the labour laws in force in the country. It shall be governed by its own by-laws as may be prescribed.

(*2*) The Centre shall not be construed as a "shop", "commercial establishment", "industrial establishment", "factory" or "industry" within the meaning of the Shops and Establishment Act, 1965 (VII of 1965), the Factories Act, 1965 (IV of 1965) or the Industrial Relations Ordinance, 1969 (XXIII of 1969).

21. **Exemption from tax, rate and duty.**—(*1*) Notwithstanding anything contained in any law for the time being in force relating to any tax, rate or duty, the Centre shall not be liable to pay any tax, rate or duty other than those paid by any other person in respect of any movable or immovable property which the Centre purchases or otherwise acquires from such person and other than those payable in respect of public utilities like water, gas, electricity, telephone and municipal rates.

(2) All non-Bangladeshi experts, technicians and research scholars employed by the Centre and working in Bangladesh for the furtherance of the objectives of the Centre shall be exempt, notwithstanding the provisions of the Income Tax Act, 1922 (XI of 1922), from payment of income tax in respect of any salary or other remuneration received or deemed to be received by them or accruing or arising, or deemed to accrue or arise in Bangladesh to them; if such salary or other remuneration of the person is also exempt from the payment of tax in the country of his domicile or permanent residence and evidence in respect of the said exemption is produced to the income tax authority concerned in Bangladesh. Such person shall also be accorded privileges for importation of personal and household effects and articles for consumption free of customs duty and sales tax as are accorded, under laws and regulation in force from time to time, to the expatriate experts, technicians and consultants working in Bangladesh under international agreements.

22. **Immunities and privileges of officers and employees.**—The Chairman, Trustee, Director, Officers, and employees—

(*a*) shall be immune from any legal process with respect to any acts performed by them in their official capacity except when the Board or the Director waives their immunity, which should be reported to the Board; and

(*b*) those who are nationals of countries other than Bangladesh, and their spouses and dependents, shall be free from immigration restrictions, other than normal visa requirements, and alien registration requirements in accordance with the laws and regulations of the Government.

23. **Immunities and privileges.**—(*1*) The centre, its property and assets wherever located and by whomsoever held, shall enjoy immunity from every form of judicial process except for criminal offences for which the Board or the Director expressly waives its immunity for the purpose of any proceeding. Such action shall be reported to the Board.

(*2*) All property and assets of the Centre shall be free from any restrictions, regulations, controls and moratoria of any nature to the extent it is necessary to carry out the objectives and functions of the Centre effectively.

(*3*) Subject to national and international laws and regulations, the Centre shall be entitled to movement of biological materials in and out of the country.

24. **Waiver or Immunity, Exemption and Privileges.**—The Board may waive any of the privileges, immunities, and exemptions granted under this Ordinance in any particular case or instance, in such a manner and upon such conditions as it may determine to be appropriate in the best interest of the Centre.

25. **Free publication and dissemination of research.**—(*1*) The Centre shall enjoy the privilege of free publication and dissemination of its research and other scientific work.

(*2*) All research materials and scientific results shall be treated as property of the Centre and shall not be used, published, duplicated or transferred for private advancements or other material gains or used by any other institution without express approval of the Centre.

26. **Patents and Copyrights.**—(*1*) The Centre shall enjoy full rights of patents and copyrights with respect thereto under Bangladesh and foreign laws.

(2) It shall be the responsibility of the Board to ensure that appropriate arrangements are made concerning the public availability of patents, licences, copyrights and the like arising from the Centre's scientific results and discoveries.

27. **Benevolent fund.**—The Centre may establish benevolent fund for its officers and employees for the purpose of providing welfare amenities and facilities for their betterment and development, and the same shall be regulated in the manner as may be prescribed.

28. **Power to make by-laws.**—The Board may make by-laws for carrying out the purposes and provisions of this Ordinance.

29. **Government support for facilities.**—The Government may provide facilities and privileges to the Centre for its proper development and expansion including lease of land at nominal or no rent.

30. **Dissolution of the Cholera Research Laboratory.**—On the commencement of this Ordinance, the Cholera Research Laboratory, in this section referred to as the CRL, shall notwithstanding anything contained in any other law for the time being in force, or in any other instrument or in the agreement under which it was established, stand dissolved and upon the such dissolution—

(*a*) all assets and liabilities of the CRL shall stand transferred to, and vested in, the Centre.

Explanation.—(*i*) The term "assets" includes all rights, powers, authorities and privileges, cash and bank balances, grants and all other interests and rights, in or arising out of, such property and all books of accounts, registers, records and all other documents or whatever nature relating thereto; and all properties, movable and immovable which were owned, used and or possessed by the CRL other than land and buildings thereupon wherever they may be situated.

(*ii*) The term "liabilities" shall be limited to all obligations to claims on behalf of *ex*-employees of the CRL at the time of dissolution for compensation or under existing employment agreements or other contractual arrangements and vendors of goods and services to the CRL.

(*b*) all officers, employees, consultants, advisors, and other staff of the CRL shall hold their respective offices on the same terms and conditions and with the same rights and privileges which were enjoyed by them immediately before the commencement of this Ordinance and shall continue to do so until the same are duly altered by the Board.

31. **Valioation, etc.**—Notwithstanding the dissolution of the Cholera Research Laboratory, anything done or action taken in good faith in or in relation to the Cholera Research Laboratory before the commencement of this Ordinance shall be deemed to have been validly done or taken, and shall have and shall be deemed always to have had effect accordingly, and shall not be called in question in any court, except those currently under adjudication.

32. **Dissolution.**—(*1*) At any time that the Board may determine by vote of not less than three-fourths of its sitting members, whether or not present and voting, that the Centre is no longer able to function effectively or is no longer required, the Board may recommend to the Government the dissolution of the Centre.

(*2*) In the event of dissolution, any land or other assets made available to the Centre by the Government, and permanent fixed capital improvements thereon, shall revert to the Government. The other assets of the Centre shall be retained by the Government and by other governments where assets distributed to institutions having purposes similar to Government or other governments where appropriate, and the Board.

ZIAUR RAHMAN, BU
MAJOR GENERAL,
President.

DACCA;
The 6th December, 1978.

A. K. TALUKDAR
Deputy Secretary.

BGP-78/79-6553G-5,760—14-12-19

[*Published in the Bangladesh Gazette, Extraordinary, dated the 23rd December 1978*]

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

MINISTRY OF LAW AND PARLIAMENTARY AFFAIRS

CORRIGENDUM

In the International Centre for Diarrhœal Disease Research, Bangladesh Ordinance, 1978 (Ordinance No. LI of 1978), published in the *Bangladesh Gazette, Extraordinary*, dated the 9th December, 1978, at pages 6285—6295,—

(1) At page 6285, in section 1, in line 1, *for* "international" *read* "International";

(2) At page 6289, in section 7, in clause 2, in sub-clause (*g*), in line 3, *for* "description" *read* "discretion";

(3) At page 6289, in section 8, in clause (*4*), in line 1, *for* "qulified" *read* "qualified";

(4) At page 6290, in section 10, in clause (*2*), in line 1, *for* "mettings" *read* "meetings";

(5) At page 6291, in section 12, in clause (*3*), in the last line, *for* "progrommes" *read* "programmes";

(6) At page 6294, in section 31, in line 1, *for* "Valioation" *read* "Validation";

(7) At page 6295, in section 32, in clause (*2*), in line 3, for the words "The other assets of the Centre shall be retained by the Government and by other governments where assets distributed to institutions having purposes similar to Government or other governments where appropriate, and the Board", *read* "The other assets of the Centre shall be retained by the Government and by other governments where assets are located, and used for similar purposes or distributed to institutions having purposes similar to those of the Centre as may be agreed between the Government or other governments where appropriate, and the Board of Trustees".

A. K. TALUKDAR
Deputy Secretary.

BGP-78/79-6976G-5,765—27-12-78.

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5/BT/June 83

RESOURCES DEVELOPMENT REPORT

RESOURCES DEVELOPMENT

The Resources Development Programme of the ICDDR,B has continued to respond positively to the increasing financial needs of the Centre; the budget, which was $3.3 million in 1979 has increased to an income of $7.0 million over a short span of five years. This represents an income of growth of over 100%.

In a world where availability of funds has become highly elastic to political considerations and deteriorating financial conditions, obtaining commitments from donors, both existing and new, has been a very exacting exercise. The world-wide uncertain financial conditions are forcing donors not only to tighten their belts but also to scrutinize their aid budgets ever more closely and divert their priorities. Coupled with this fact, the competition among the international organizations for the shrinking multilateral funds is becoming more and more intense. ICDDR,B has thus far succeeded in maintaining its lead over others in this race, and we hope will continue to do so in the future.

Success of the Resources Development Programme has been primarily due to our highly aggressive campaign to draw international attention to the ICDDR,B, as a resource that holds the key to the solution of the global scourge of diarrhoeal diseases. During the current reporting period, we have actively followed up with our existing donors and have pursued new sources of funds.

NEW COMMITMENTS

I am pleased to inform you, Mr. Chairman, that during the first half of 1983 the Centre received an important new financial commitment in the amount of US $350,000 from the Arab Gulf Fund. Furthermore, ICDDR,B has now become a "listed project" with them and hopefully we will receive further support in 1984 and beyond.

In late 1982 ICDDR,B had applied for the residual funds remaining in the now defunct United Nations Relief Operations in Bangladesh, UNROB. Both

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UNDP as the executing agency of this fund and the Government of Bangladesh agreed to release this fund to ICDDR,B, then estimated at US $1.0 million. This money was to be made available to the Centre for providing services exclusively in Bangladesh.

Although UNDP insisted that the UNROB fund be treated as an outright grant, the Government of Bangladesh found it more expedient to treat it as a loan. With the concurrence of the Board, we agreed to accept this money as an interest-free loan. Subsequently an agreement was signed with the Government of Bangladesh and an amount of US $1.182 million was released to the Centre in May, 1983.

We would like to extend our gratitude to the Government of Bangladesh for making this money available to us at a time when the Centre was experiencing a rather difficult cash-flow problem. ICDDR,B is a non-profit organization, and the UNROB money is being used exclusively for delivery of health services in Bangladesh and for providing treatment to 150,000 patients who visit the ICDDR,B treatment centres every year. Therefore, we would like to suggest that the Board of Trustees pass a resolution thanking the Government of the People's Republic of Bangladesh and requesting the Honorable Minister of Health and Population Control, Major General M. Shamsul Haq, to kindly take up this matter with the Government for conversion of this loan into an outright grant.

In 1982, the world experienced serious currency fluctuation, with most currencies sliding negatively against the US dollar. Commitments made in currencies other than the US dollars, such as the pound sterling, Swedish Kroner and the Australian dollar, fetched fewer US dollars than originally estimated. However, the fluctuation of the Bangladeshi taka against the US dollar resulted in a net gain for the Centre which amounted to US $ 0.48 million. This extra budgetary amount is being carried over to 1983.

Mr. Chairman, our request for the residual UNROB fund in 1982 was for the purpose of meeting a resource gap in the amount of US $1.0 million.

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However, the amount disbursed to us in May this year was US $1.182 million. But due to exchange fluctuations, the actual amount received in Bangladesh taka was equivalent to US $1.5 million. This extra budgetary US $0.5 million has also been added to the income of 1983.

A new source of income for the Centre this year will be the Saudi [illegible] project. The project will enable us to cover our overhead costs [illegible] also to shift some of the core staff to the project. This will result [illegible] saving of US $150,000 to our core fund.

The Centre began discussions with UNICEF, with whom we share mutual objectives. As a result of these discussions a proposal was submitted to them for their support to our core fund. This proposal was also endorsed by the Government of Bangladesh at the recent meeting of the UNICEF Executive Board. Prior to this meeting, we held detailed discussions with Mr. James Grant, Executive Director, for UNICEF support. Mr. Chairman, as you are aware, the UN system has again suffered drastic shortfall in their funding for the current fiscal year. In view of this development, we think it would be more prudent and realistic to estimate the support which the UNICEF may provide in 1983 at approximately US $600,000. This represents a reduction of about 50% in the amount originally requested for 1983.

We are also in the final stages of our negotiations with the Ford Foundation and the Government of Bangladesh for the evaluation of the current status of ORS in Bangladesh. This tripartite agreement will generate US $160,000 during 1983.

RENEWALS

Several existing agreements with our donors came up for renegotiation this year and we have been fortunate to secure their renewals. After expiry of the current agreement in 1983, UNDP will provide a second cycle of funds for clinical research which will begin in 1984 and continue up to 1986. The UNDP contribution will be at a somewhat reduced level compared to the previous grant and will fund the Centre directly rather than through the WHO.

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The Government of Switzerland, which had earlier extended its first cycle of funding, has now agreed to renew its commitment up to 1986. The Swiss Government has also agreed to increase its contribution to S.FR. 2,485,000 during the next three years.

The Overseas Development Authority of the United Kingdom has also notified us of the renewal of its grant to ICDDR,B. This renewal will include a modest increase over the previous grant.

Australia has also renewed its grant to the ICDDR,B. It is expected that the new grant will make provisions to cover the loss to the Centre due to currency fluctuation.

The Aga Khan Foundation has agreed to extend its support in 1984, but at a very modest level.

The Dhaka USAID Mission has renewed its commitment to the MCH-FP Extension project of the Centre for 1983. The amount committed for this year is US $459,000.

The Centre had requested an increase in the Japanese contribution in 1983. While there was no increase in their grant this year, the Centre achieved the unique distinction of becoming the first institution of its kind to be given a budget line in Japan's national budget after only one year of funding. We may thus expect continued funding from Japan and are hopeful for an increase in 1984.

In addition, Belgium and the World University Service of Canada have agreed to support scientists working at the ICDDR,B. Belgium is interested in supporting two Belgians now working at the Centre. They have also agreed to recruit two more scientists for us in the near future. The World University Service of Canada has also agreed in principle to extend support by providing Canadian mid-level scientists in various areas. Obtaining the services of these scientists will result in considerable savings to our core fund. I may mention here, Mr. Chairman, that the Centre had received such scientists in

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the past from the United Kingdom, and we should once again approach the ODA for the revival of these positions.

COLLABORATIONS

In the first half of 1983, ICDDR,B has entered into collaboration with some of the major national health institutions of Bangladesh. Collaborative arrangements with Bangladesh Medical Research Council, National Oral Rehydration Project and the Bangladesh Rural Advancement Committee will go a long way in developing a closer and more harmonious relationship with our host country.

Discussions have also been initiated with China and other developing countries, for scientific collaboration and technical assistance. We have already approached some donors for funding such projects under tripartite arrangement so that these projects could be fully funded and our overhead expenditures covered.

CAPITAL DEVELOPMENT

The construction of the first floor of the Centre's new treatment centre and clinical research building was completed with the help of two grants from the OPEC Fund, totalling US $1.5 million. This building was formally inaugurated earlier this year by Dr. Ibrahim Shihata, Director General of the OPEC Fund. We have already submitted a second proposal to the Fund for the completion of the six remaining floors of this building. I will visit the OPEC Fund headquarters in Vienna in July to discuss our second proposal. Should OPEC make the funds available for the completion of this treatment centre and clinical research building, we suggest that we may name this building the "OPEC Building."

In addition to the above, we have also approached the Government of Japan for their support to our Capital Development Programme. This proposal includes requests for both construction and equipment.

You may recall, Mr. Chairman, that we had submitted a proposal to UNCDF for funding the cost of constructing and equipping the field stations of the Centre. Land for this purpose has been acquired both in Matlab and Teknaf. Our discussions with UNCDF revealed that they can extend their support only if the Government of Bangladesh forwards our case. With your permission,

Chairman, I would request the Honorable Health Minister to kindly re- our proposal to UNCDF. This will enable us to improve services at our rural treatment centres.

1983 INCOME STATUS AND FORECAST

ICDDR,B started the fiscal year 1983 with approximately US $5.0 million in donor commitments. By the middle of this year we have more than US $6.0 million already committed (Attachment A). At this point of the year we estimate another US $815,000 in additional donor commitment by the end of 1983, bringing the total income for the year to US $7.34 million. Our projection for 1983 was US $7.0 million; with hard work and a little bit of good luck, Mr. Chairman, we hope to achieve this target.

1984 INCOME STATUS AND FORECAST

The Resources Development Programme since it began in 1979 has been successful in meeting the income forecasts each year. As I have already stated, beginning with a budget of US $3.3 million we hope to achieve an increase in our income by more than 100% to US $7.0 million in 1983. However, it must be recognized that the variables that we have to deal with are extremely unpredictable and all international agencies, except ICDDR,B have suffered major cutbacks.

Based on our past experience and taking into account the growing political and economic uncertainties in the world today, I hesitate to make an income projection beyond the US $7.0 million level for 1984 (Attachment B). None the less, we will vigorously continue to pursue our challenge and once again we hope to fulfill our commitment.

CONSULTATIVE GROUP

The fourth meeting of the Consultative Group of the ICDDR,B will be held in New York on June 17, 1983. As in the past, the Consultative Group meeting will coincide with the UNDP Governing Council meeting to insure wider participation. At this point, Mr. Chairman, I would like to raise some fundamental issues concerning the scope of our Consultative Group. We have by now held three such meetings and time has come for us to assess the

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results and draw up specific programmes and objectives for the future of this Group.

ICDDR,B currently has the participation of 38 countries and international agencies, 21 of them are donors. The scope of the Centre's activities has increased and the need for wider donor support is also becoming imperative. Side by side with the financial aspects, expansion of the Centre's scientific collaboration with other countries must also increase. This will represent the true manifestation of the Centre's international character. I am afraid operating exclusively out of Dhaka deprives the Centre of the high international visibility it must now have to draw both donors and prospective recipients of our services.

As I have already mentioned earlier, international fund raising has become highly competitive. An analysis of our sources of income will show that more than 50% of our budget is met by contributions from the North American countries. These sources have to be actively pursued in view of our future interest. Dissemination of the knowledge gained through research at the Centre must be spread beyond Asia to Africa and Latin America in a proper way. Our experience in the recent International Conference on Oral Rehydration Therapy (ICORT) has shown that scientific and financial collaboration are subject to political influence and must be effectively countered, wherever necessary, to insure the stability of an international organization.

In view of the above, I request the Board to give due consideration to the establishment of a permanent Consultative Group of the ICDDR,B under the auspices of the United National Development Programme in New York. I may mention here that such a group already exists for agricultural research centres of the world. A permanent Consultative Group will insure high international visibility for the Centre, proper dissemination of knowledge among developing countries, increased cooperation and collaboration with various health research centres, and a sound financial base for the ICDDR,B.

In conclusion, Mr. Chairman, I would like to say that the success of Resources Development depends on the continued scientific productivity of the Centre and our ability to disseminate the results. The expectation of

donors and the developing countries is increasing. Political and economic uncertainties of the world are making our efforts increasingly difficult. Time has now come to stabilize our financial commitments. However, as in the past, we will continue our vigorous efforts to meet our annual income projections.

Attachment (a)

Donor 1983

(In US $)

	Committed	Prospective
UNRESTRICTED		
Australia	163,000	-
Bangladesh	37,000	-
Japan	200,000	-
SAREC/Sweden	72,000	-
Saudi Arabia	100,000	-
Switzerland	270,000	-
United Kingdom	200,000	-
USAID	1,900,000	-
Sub-total	2,942,000	-
RESTRICTED		
Aga Khan Foundation (ORT)	25,000	-
Arab Gulf Fund (mixed)	350,000	-
Belgium	75,000	-
CIDA/WB(Hand pumps)	179,000	-
Ford Foundation (ORT evaluation)	-	160,000
France	60,000	-
GTZ(Munshiganj)	56,000	-
IDRC (DISC)	66,000	-
IDRC(San Impact phase-I & II)	26,000	30,000
IDRC(Sc. Editor)	-	25,000
Princeton and POCO	25,000	-
SAREC-Immunity/Vaccine	76,000	-
UNDP(Clinical Research)	250,000	-
Sub-total	1,188,000	215,000

	Committed	Prospective
Restricted contd.		
B.E.	1,188,000	215,000
UNDP/WHO(Reg'l Training)	85,000	-
UNFPA(MCH-FP)	66,000	-
UNFPA (DSS)	426,000	-
UNICEF/IDRC(Water/San Conf)	60,000	-
UNICEF (Global)	-	600,000
USAID(MCH/FP-Ext.)	595,000	-
USAID/POOO (Ops Res)	83,000	-
Saudi Arabia	100,000	-
UNROB	500,000	-
Sub- Total Restricted	3,103,000	815,000
Sub- Total Un-restricted	2,942,000	-
Total	6,045,000	815,000
FC Tk. Exchange gains for '82 carried over to '83	480,000	
	Grand Total	7,340,000

Attachment (b)

Donor 1984

UNRESTRICTED	Committed	Prospective
Australia	200,000	-
Bangladesh	35,000	-
Japan	200,000	200,000
SAREC/Sweden	72,000	-
Saudi Arabia	100,000	-
Switzerland	375,000	-
United Kingdom	200,000	-
USAID	1,900,000	-
Sub-total	3,082,000	200,000

RESTRICTED		
Aga Khan Foundation (ORT)	-	30,000
Arab Gulf Fund (mixed)	-	350,000
Belgium	-	75,000
CIDA (DSS +computer)	1,000,000	-
CIDA (Training)	-	100,000
CIDA/WB (Hand-pumps)	95,000	-
France	60,000	40,000
GTZ(Munshiganj)		30,000
IDRC (DISC)	75,000	-
IDRC (San Impact,Phase-II)	-	62,000
IDRC (Sc. Editor)	-	50,000
Princeton & POCO	25,000	-
SAREC- Immunity/Vaccine	76,000	24,000
UNDP Clinical Research	250,000	-
UNDP (DWSS: Women & Water)	-	100,000
Sub-total	1,581,000	861,000

contd...

Restricted contd..	Committed	Prospective
B.F.	1,581,000	861,000
UNDP/WHO (Reg'l Training)	-	30,000
UNFPA (MCH-FP)	66,000	-
UNICEF Global	-	500,000
UNICEF (Country:ORT, Training)	-	50,000
USAID (MCH-FP/Ext)	459,000	-
Ford Foundation (Simmons)	-	50,000
Saudi Arabia/UAE	-	200,000
Sub-total Restricted,	2,106,000	1,691,000
Sub-total Unrestricted,	3,082,000	200,000
Total	5,188,000	1,891,000

Grand Total, 7,079,000

6/BT/June 83

REPORT OF THE FINANCE COMMITTEE

REPORT OF FINANCE COMMITTEE

Since the December 1982 meeting of the Board the Finance Committee has met twice, once in Dhaka at the Centre on 3 February, 1983, and once in New York at IIE on 12 June, 1983. The financial position of the Centre was reviewed. It was noted that in 1982 expenditure was below the budgetted amount of 4.5 being 4.3 million dollars. From the first quarter report for 1983 the projected expenditure for 1983 will be 6.2 million also within the 6.5 million dollar budget.

The cash position and cash flow were reviewed against projections. There is still delay of actual cash receipt against forecast. This requires an even more cautious approach to cash flow projections. It also requires improved follow up by the Centre. The Resources Development Office has noted this as an urgent matter requiring staffing. The Review of Financial Position 1983 is included. A reserve fund has been established as requested by the Board in Resolution 6/Nov. '81, point (d).

A special contribution from UNDP has been received (UNROB Fund). This has been designated as a loan. A letter from the Government of Bangladesh reads as follows:

"Please refer to the Loan Agreement between ERD and ICDDRB for the UNROB funds to be used as interest-free loan by your organisation.

In this connection I would like to refer to Bangladesh Bank's letter No. EDS:226/83 dated 10th May 1983 wherein they informed you and ERD that a sum of TK.2,89,28,774.88 (Taka two crores eighty nine lacs twenty eight thousand seven hundred seventy four and paisa eighty eight only) has been deposited on 5th May 1983 to Agrani Bank, Principal Office, Motijheel Commercial Area, Dhaka for credit to Account No. 7697 of ICDDRB

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with them. The loan become effective from 5th May 1983 as per Loan Agreement signed between ERD and ICDDRB and this interest-free loan will run for the period from 5th May 1983 to 4th May 1984.

In view of the above, I would request that this Agreement may be confirmed in your next Board meeting and an undertaking be given that the amount will be repaid after one year.

Needless to mention that this amount is interest-free and it should be ensured that the fund be used by ICDDRB for its current operations only and not kept as term-deposit in Bank to earn interest. With regards,"

It is suggested that since this fund is designated for service to the people of Bangladesh and is being applied by the Centre for this purpose that the following resolutions be passed by the Board:

RESOLUTION /BT JUNE '83
The Board of Trustees of ICDDR,B accepts an amount of US$ 1,181,731 from the Government of Bangladesh out of the UNROB Fund and places on record its deep sense of appreciation of the same.

RESOLUTION /BT JUNE '83
The amount given nominally as a loan for providing services exclusively in Bangladesh has been of immense help in continuing the activities of the Centre. The Centre will face serious adverse financial crisis in case the Centre is called upon to repay this amount.

RESOLUTION /BT JUNE '83
In view of the facts and position stated above, the Board of Trustees unanimously requests the Government of Bangladesh to convert this amount of US$ 1,181,731 as grant to the Centre in order to enable the Centre to continue its activities in Bangladesh.

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A report on the progress in Resources Development was made and appears under Agenda 5 of the Board Minutes. It was noted that income has increased over a five year period from 3.3 to over 7.0 million US dollars. This was achieved during a period of severe global economic recession. Although optimistic, the level of work needed to sustain such a growth rate is at the limit of the Centre's capacity. As new donors were enlisted the workload of timely follow up and reporting has increased rapidly. Trained staff are lacking to meet further expansion of this requirement. Hence, a more conservative forecase of 7.0 million US dollars has been given for 1984. Important new donors have joined in and have been committed in 1983. These include the Arab Gulf Fund, UNICEF, Canada, UNROB, and Belgium. Renewals have been associated with increases, as well as changes particularly in the case of Japan which signed a long term commitment. With completion of the first phase of the building a new approach to the OPEC Fund has been made. It should be noted that the Director General of the OPEC Fund, Mr Ibrahim Shibuta, personally visited Dhaka to inaugurate this facility.

The budget for 1984-85 was reviewed. A detailed manpower plan was presented and both appear as Document 8/BT June '83 in the Board papers. In view of the wish to be conservative in the forecast of income for 1985, a ceiling of 7.3 million US dollars is suggested. This would provide for all requirements except new recruiting to international level positions. The approach to this has already been initiated in discussions with several donor agencies and countries and indications are excellent that staff can be recruited in this way without committing the Centre's budgetted funds. Recruiting equivalent to $500,000 would be needed to meet the needs of the Centre would be necessary to meet the proposed manpower plan.

The Finance Committee met with the representative of the auditor (Deloitte, Hoskins and Sells) in the absence of the management

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of the Centre and found the Centre's accounts to be as reported. Suggestions for improvements were received and will be acted upon where possible.

FINANCIAL REPORT OF ICDDR,B TO FINANCE COMMITTEE OF BOARD AS OF 20.4.8

1. Operating Expenditure Statement (see attachment)

The first four months adjusted expenditure is approximately $ 1.66 million as against a budget of $ 1.96 million. This reflects that expenditure has been reduced by about $ 300,000 for the first four months which has been largely due to:

a) Savings from the delay in recruitment of "P" level staff.

b) Savings as a result of improved control and timing of purchases.

c) Savings from printing and reproduction, rent communications and utilities, transportation and other contractual services.

By the end of FY 1983 it is expected that most of the savings in personnel costs will be wiped out with the regularisation of project employees salary scales to WHO scales. Subject to the Board's approval the conversion of project employees to WHO scales would mean an additional yearly cost of some $ 150.000 to be funded from the core Budget. The projected expenditure by the end of 1983 is expected to be in the region of $ 6.2 million as shown below:

	4 months Actual	Budget Balance	Projected Actual for Year
Personnel services	1.366,700	3.211.300	5.578.000
Travel	95.720	238.740	334.460
Transportation	4.550	42.900	47.450
Rent,Comm.& Utilities	12.530	66.600	79.130
Printing & Reproduction	4.370	70.000	74.370
Other contractual services	32.810	112.000	144.810
Supplies & Materials	158.640	526.600	685.240
Depreciation/Capital Replacement	90.000	184.900	275.900
Total	1.765.320	4.453.040	6.218.360

II. CASH POSITION

Although the operating statement indicates a possible reduction in expenditure of approximately $ 300.000 for FY 1983, the cash position as it stands is not very good.
The cash flow statement for 4 months to April 1983 shows as accumulated deficit of cash of some $ 2.0 million. This has been due to projected receipts not being received as were scheduled. Up to end April the bank overdraft position was $ 820.000. There was therefore no way that amount of $ 700.000 could be set aside in the Reserve Fund as planned. Furthermore to help offset the bank overdraft from increasing further $ 400.000 was drawn from USAID two months earlier than scheduled. The main problem in the cash shortfall was the delay in the release of UNROB funds.

However the funds have since been released, but due to the repayment condition attached to the release of the money, the Centre's cash picture which at the moment is not so bright, is further aggravated by money to be set aside for repayment of this "loan".

In order to set aside sufficient funds to amortize the loan of $ 1.18 million by May 1984, an amount of some $ 800.000 will be provided this year. The projected income for FY 1983 is expected to reach $ 7.2 million. To set aside $ 800.000 for loan repayment, the net income for FY 1983 would be reduced at $ 6.4 million. This is again based on the assumption that the figures of income predicted for FY 1983 will materialise as forecasted.

Based on this assumption the Centre should by the end of FY 1983 have approximately $ 200.000 in its reserve fund, a far cry from the original provision of $ 1,050.000. It is imperative that the Board now address the issue at hand and that is to instruct the Director to seek immediate steps to convert the UNROB loan to a grant so that

the Centre's financial position can be restored to the projected levels as originally presented to the Board at the December 1982 meeting.

Otherwise more efforts must be directed at fund raising in order to increase donor support to offset the anticipated shortfall.

EXPENDITURE STATEMENT

For 4 months to 30 April, 1983

	Budget	Actual	Variance + (-)
Personnel Services	1.473.600	976.681	496.919 (1) (2)
Travel	74.560	95.720	(21.160)
Transportation	21.400	4.549	16.851
Rent, Comm.& Utilities	33.200	12.525	20.675
Printing & Reproduction	34.800	4.368	30.432
Other Contract. Services	56.000	32.810	23.190
Supplies & Materials	263.300	158.634	104.666
Total Expenditure	1.956.860	1.285.287	671.573
Adjustments			
(1) Provision for salary increase	-	390.000	(390.000)
(2) Project travel of Saudi to be reimbursed (extra budgetary)	-	(20.000)	20.000
Total adjusted expenditure	1.956.860	1.655.287	301.573

CASH FLOW STATEMENT

At 30,4,83

	Budget	Actual	Variance
Opening Bank Balance	(241.936)	(760.085)	(518.149)
Receipts Brought Over from Previous Year	1.156.000	70.500	(1085.500)
Receipts for the Year	1.850.000	1.403.059	(446.945)
Total Cash Available	2.764.064	713.474	(2.050.590)
Total Operating Exp:	1.956.860	1.285.287	671.573
Advances	-	251.105	(251.105)
Total Cash Expenditures	1.956.860	1.536.392	420.468
Amount to Reserve Fund	700.000	-	700.000
Closing Bank Balance	107.204	(822.918)	(930.122)

DONOR SUPPORT

Projected Receipts Vs. Actual Receipts

Up to April 30,83

Unrestricted	Budget	Actual	Variance
Kingdom of Saudi Arabia	100,000	100,000	-
USAID	500,000	900,000	400.000
UNROB	1.000,000	-	(1,000,000)
JAPAN	200,000	-	(200,000)
SWITZERLAND	270,000	-	(270.000)
Total Unrestricted	2.070.000	1.000.000	(1.070.000)
Restricted			
SHEIKH SALEH AL ABDUL AZIA	-	13.974	13.974
AUSTRALIAN HIGH COMMISSION	-	278	278
AGA KHAN FOUNDATION	25,000	-	(25.000)
CIDA-WB	214.000	-	(214.000)
IDRC	-	21.369	21.369
FRANCE	60,000	-	(60.000)
SAREC	-	38.733	38.733
GTZ MUNSHIGANJ	56.000	50.000	(6.000)
UNDP-WHO REGIONAL	75.000	36.336	(38.664)
UNFPA-DSS	106.500	111.350	4.850
UNFPA-MCH	16.500	20.500	4.000
UNICEF WATER SANITATION	20.000	-	(20.000)
USAID-MCH/FP/EXTENSION	297.500	151.019	(146.481)
USAID-POP COUNCIL	41.500	-	(41.500)
USAID CLINICAL NUTRITION	2.400	-	(24.000)
UNDP WATER EMBANKMENT	-	30.000	30.000
Total Restricted	936,000	473.559	(462.441)
Total Donor Receipts	3.006,000	1.473.559	1.532.441

7/BT/June 83

APPROVAL OF FY 1982 AUDIT REPORT

April 18, 1983.

The Board of Trustees,
International Centre for Diarrhoeal Disease
Research, Bangladesh,
G.P.O. Box - 128,
Dhaka - 2,
BANGLADESH

Dear Sirs,

In connection with our examination of the financial statements of International Centre for Diarrhoeal Disease Research, Bangladesh, for the year ended 31st December, 1982, we have made a general review of the accounting procedures and related areas. We have also evaluated the system of Internal control.

We set out in this letter a number of comments and recommendations resulting from our examination of the above areas. Our comments relative to Transactional audits and points of minor nature are not included in this report. That report has been forwarded to the Director direct together with a copy of this report.

1. GENERAL

1.1 The Board of Trustees are the custodian of the assets of the Centre and that they are governed by the Ordinance signed by the then President of the Government of the Peoples Republic of Bangladesh, which was published in Bangladesh Gazette Extraordinary of December 9, 1978.

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1.2 We will be glad to know whether this Ordinance was required to be passed as an Act by the Parliament or the Ordinance as signed by the then President of the Government of the Peoples Republic of Bangladesh can be taken as the final document not requiring any further action by any other authority.

1.3 Clause 6 of the Ordinance indicated that the first Board will be appointed for a period of three years and the new Board to take over the charge with effect from February 14, 1982, and should continue upto February 13, 1985. This has not been followed.

1.4 Maintenance of Accounts

In clause 18 of the Ordinance, it has been mentioned that the maintenance of accounts of all receipts and expenditure of the Centre should be in the manner as may be prescribed. The intention of the Ordinance as we understand, is that the manner of maintenance of accounts of all receipts and expenditure of the Centre should be prescribed by the Board of Trustees. In fact, in the first meeting of the Board of Trustees, the trustees requested the Director to prepare for its consideration a set of regulations concerning the receipts, disbursements and accounting of all funds and properties owned or controlled by the Centre. We have not been able to ascertain from the subsequent minutes of the Board of Trustees that this request was adhered to.

2. REGULATORY

By-laws

Clause 28, of the Ordinance provides for making by-laws for carrying out the provisions of the Ordinance. A draft of the by-laws were shown to us, but we would suggest that all relevant by-laws relative to the Ordinance should be approved by the trustees.

3. FINANCIAL MATTERS

3.1 The Centre is maintaining an asset register. It is our understanding that some of the assets are not currently in use and valuation of which are not available. We would strongly recommend a valuation of all assets including lands donated by Bangladesh Government.

3.2 Taxation

Taxation in respect of expatriates has not been deducted when paid to the expatriates outside Bangladesh. There may be a liability for some expatriates in respect of previous years. An amount of $ 110,000 has been included as contingent liability as a note to the account.

3.3 Insurance

We understand that there are no insurance policies for all assets excepting Motor Vehicles. While we understand that heavy premium will have to be paid yearly, we would like to inform that custodian of the assets to review the situation for any accidental situation that may arise in future and severely affect the working function of the Centre.

We would like to take this opportunity to thank I.C.D.D.R.-B management and staff for the co-operation extended to us during the course of our audit and look forward to hearing your comments on the above matters in the not too distant future.

The above comments have the concurrence of our Joint Auditors Messrs. Ahmad Hoque & Co. Dhaka, Bangladesh.

Yours faithfully,
for DELOITTE HASKINS & SELLS

(S.K. GUPTA)
PARTNER

c.c. The Director,
International Centre for Diarrhoeal Disease Research, Bangladesh,
G.P.O. Box 128,
Dhaka - 2,
BANGLADESH

8/BT/June 83

PRESENTATION OF FY 1984 BUDGET

INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

BREAKDOWN OF PROPOSED 1984 BUDGET

RESEARCH AND TRAINING SUPPORT FACILITIES

Program Code	Description	Person Year	Personnel Services 11	Travel & Transportation of pers 21	Transp. of Things 22	Rent, Comm. & Utilities 23	Printing & Reproduction 24	Other Contractual Services 25	Supplies & Materials 26	Equipment 46	Total
06	RESEARCH & TRN. SUPP.FACILITIES	272	845,900	4,500	21,200	19,500	29,800	700	325,700	193,100	1,440,400
060100	Dhaka Station		415,600	-	200	700	1,100	500	131,500	7,700	557,300
060200	Matlab Field Station		109,700	2,000	1,200	7,500	800	100	128,200	2,700	352,200
060300	Teknaf Field Station		19,600	1,600	600	1,300	1,600	100	15,400	300	40,500
060401	Microbiology Department		63,600	600	3,600	200	2,100	-	15,400	19,800	105,300
060402	I.V. Fluid Unit		14,700	-	-	100	100	-	6,500	-	21,400
060501	Biochemistry Department		19,200	-	4,800	300	800	-	4,200	57,300	86,600
060601	Immunology Department		7,400	-	200	100	100	-	1,600	500	9,900
060700	Statistics		9,700	-	-	-	900	-	900	6,600	18,100
060801	Animal Resources		16,000	100	-	400	200	-	16,300	11,000	44,000
060900	Computer		57,600	100	3,200	3,700	200	-	-	74,000	138,800
061001	Community Studies		28,200	-	-	-	100	-	200	1,500	30,000
061101	Library Services		62,500	100	7,200	5,200	-	-	3,500	11,700	90,200
061102	Publication		22,100	-	200	-	21,800	-	2,000	-	46,100

INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

1984 OPERATING BUDGET
(IN US DOLLAR)

Program Code	Description	Person Year	Personnel Services 11	Travel & Transp of Persons 21	Transp. of Things 22	Rent, Communication & Utilities 23	Printing & Reproduc 24	Other Contrac. Services 25	Supplies & Materials 26	Equipment 46	1984 Total	1983 Budget	1985 Projection
	RESEARCH PROGRAM	400	2,789,800	47,800	1,800	25,300	19,600	35,000	273,000	27,900	3,220,200	2,665,100	3,703,[illegible]
01	Disease Transmission	42	479,600	6,800	600	7,000	2,900	6,500	53,600	7,200	564,200	663,300	648,[illegible]
02	Pathogenesis & Therapy	35	524,500	8,000	200	5,400	1,500	4,600	60,900	3,500	608,600	426,300	699,[illegible]
03	Host Defense	16	246,200	5,500	200	1,100	1,100	1,300	22,000	9,700	287,100	202,500	330,200
04	Nutrition	76	403,500	9,000	200	4,100	2,400	7,700	37,500	1,300	465,700	459,600	535,600
05	Community Services Research	231	1,136,000	18,500	600	7,700	11,700	14,900	99,000	6,200	1,294,600	913,400	1,488,800
06	RESEARCH & TRAINING SUPPORT FACILITIES	272	845,900	4,500	21,200	19,500	29,800	700	325,700	193,100	1,440,400	1,065,800	1,656,500
07	TRAINING PROGRAM	28	301,700	29,300	600	3,600	9,100	9,900	42,700	10,000	406,900	305,400	467,900
08	MAINTENANCE & LOGISTICS	94	258,100	8,000	44,200	23,700	900	4,100	33,900	66,700	439,600	448,200	505,300
09	MANAGEMENT	111	862,200	59,700	1,500	31,200	9,400	54,700	110,300	28,200	1,157,600	1,039,300	1,331,200
10	RESOURCES DEVELOPMENT	5	138,900	49,700	400	3,500	2,500	4,300	6,400	2,800	208,500	201,300	239,800
11	MANDATORY COMMITTEE	-	40,000	98,600	700	700	600	[illegible],000	1,100	-	142,700	123,200	164,100
12	EMPLOYEE BENEFIT	21	43,400	200	200	300	800	20,100	29,000	800	94,800	66,200	109,000
13	PROJECT DEVELOPMENT	141	344,500	45,700	10,000	17,100	72,700	40,300	65,600	4,400	600,300	505,100	690,300
14	STAFF DEVELOPMENT	3	50,400	6,600	-	600	600	22,000	8,800	-	89,000	80,000	102,400
	GRAND TOTAL	1,075	5,674,900	350,100	80,600	125,500	146,400	192,100	896,500	355,900	7,800,000	6,500,000	8,970,000

INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

BREAKDOWN OF PROPOSED 1984 BUDGET

TRAINING PROGRAM

Program Code	Description	Person Year	Personnel Services 11	Travel & Transp.of persons 21	Transp. of Things 22	Rent, Comm. & Utilities 23	Printing & Reproduc. 24	Other Contrac. Services 25	Supplies & Materials 26	Equipment 46	1984 Total
07	TRAINING PROGRAM	26	301,700	29,300	600	3,600	9,100	9,900	42,700	10,000	406,900
070100	Training, Extension & Communication Working Group		225,500	-	500	2,100	7,000	-	14,500	2,300	251,900
070300	Training Department		54,000	100	-	800	900	5,600	8,800	1,800	72,000
070400	Medical Illustration		16,100	100	-	-	200	100	1,100	900	18,500
070502	Feasibility of rice based on ORS		3,100	-	-	-	-	-	-	-	3,100
070600	Training Activities		-	28,300	100	700	800	1,200	5,100	4,400	40,600
070623	Urban Volunteer Training Program		3,000	800	-	-	200	3,000	13,200	600	20,800

INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

BREAKDOWN OF PROPOSED 1984 BUDGET

MAINTENANCE & LOGISTICS

Program Code	Description	Person Year	Personnel Services 11	Travel & Transp.of persons 21	Transp. of Things 22	Rent, Comm. & Utilities 23	Printing & Reproduction 24	Other Contractual Services 25	Supplies & Materials 26	Equipment 46	Total
08	MAINTENANCE & LOGISTICS	94	258,100	8,000	44,200	23,700	900	4,100	33,900	66,700	439,600
080100	Supply Department		69,200	3,400	41,500	900	500	1,200	9,100	8,200	134,000
080200	Transport		72,400	1,100	200	500	100	1,200	5,500	52,800	133,800
080300	Maintenance		116,500	3,500	2,500	22,300	300	1,700	19,300	5,700	171,800

INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

BREAKDOWN OF PROPOSED 1984 BUDGET

MANAGEMENT

Program Code	Description	Person Year	Personnel Services 11	Travel & Transp.of persons 21	Transp. of Things 22	Rent, Comm.& Utilities 23	Printing & Reproduc. 24	Other Contrac. Services 25	Supplies & Materials 26	Equipment 31	1984 Total
09	MANAGEMENT	111	862,200	59,700	1,500	31,200	9,800	54,700	110,300	28,200	1,157,600
090100	Director & Supporting Staff		272,300	7,700	100	14,000	7,000	18,200	17,100	2,900	339,300
090102	Consultants		40,000	28,900	-	300	200	600	200	-	70,200
090103	Advisory Council Meeting		-	-	-	-	-	300	-	-	300
090104	Scientific Advisory Council meeting		-	-	-	-	-	600	-	-	600
090105	Research Review Committee		-	-	-	-	200	200	200	-	600
090106	Ethical Review Committee		-	-	-	300	100	2,100	300	-	2,800
090107	Directors Program Dev.		-	-	-	-	-	26,000	-	-	26,000
090201	Associate Director & Supporting Staff		162,400	9,900	100	2,700	100	600	4,500	200	180,500
090202	Personnel & General Services Branch		168,500	2,200	100	1,100	600	600	20,300	1,400	194,800
090203	Travel Office		8,800	1,200	-	600	100	100	3,800	200	14,800
090204	Estate Office		30,200	100	-	3,000	-	200	4,500	3,300	41,300
090501	Controller & Supporting Staff		119,000	8,800	100	5,400	1,300	4,700	22,600	18,300	180,200
090601	Physical Plant Office		61,000	900	1,100	3,800	200	500	36,800	1,900	106,200
10	RESOURCES DEVELOPMENT	5	138,900	49,700	400	3,500	2,500	4,300	6,400	2,800	208,500
100100	Resources Development		131,100	46,900	300	3,300	2,200	2,600	4,200	2,500	193,100
100200	Public Relation & Information Service		7,800	2,800	100	200	300	1,700	2,200	300	15,400

INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

BREAKDOWN OF PROPOSED 1984 BUDGET

MANDATORY COMMITTEE AND EMPLOYEES BENEFITS

Program Code	Description	Person Year	Personnel Services 11	Travel & Transp.of persons 21	Transp. of Things 22	Rent, Comm. & Utilities 23	Printing & Reproduc. 24	Other Contrac. Services 25	Supplies & Materials 26	Equipment 46	1984 Total
11	MANDATORY COMMITTEE		40,000	98,600	700	700	600	1,000	1,100	-	142,700
110100	Board of Trustees		40,000	80,400	250	500	400	900	1,000	-	123,450
110300	External Scientific Review Meeting		-	7,200	250	100	100	50	50	-	7,750
110500	Consulting Group		-	11,000	-	-	-	-	-	-	11,000
110600	Program Coordination Committee		-	-	200	100	100	50	50	-	500
12	EMPLOYEE BENEFIT	21	43,400	200	200	300	800	20,100	29,000	800	94,800
120100	Employees Clinic		10,200	100	100	50	600	2,400	26,900	600	40,950
120200	Staff Welfare Association		7,600	100	100	250	200	8,800	2,100	200	19,350
120300	Subsidy to Cafeteria		25,600	-	-	-	-	8,900	-	-	34,500

INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

BREAKDOWN OF PROPOSED 1984 BUDGET.

PROJECT DEVELOPMENT & STAFF DEVELOPMENT

Program Code	Description	Person Year	Personnel Services 11	Travel & Transp.of persons 21	Transp. of Things 22	Rent, Comm.& Utilities 23	Printing & Reproduc. 24	Other Contrac. Services 25	Supplies & Materials 26	Equipment 46	1984 Total
13	PROJECT DEVELOPMENT	141	344,500	45,700	10,000	17,100	72,700	40,300	65,600	4,400	600,300
130101	MCH-FP Extension - Dhaka		53,000	6,500	-	200	6,700	5,400	6,100	300	78,200
130102	MCH-FP Extension - Munshiganj		14,800	1,800	-	100	1,900	1,500	1,700	100	21,900
130103	MCH-FP Extension - Sirajganj		65,800	8,100	-	300	8,400	6,700	7,600	300	97,200
130104	MCH-FP Extension - Noapara		60,000	7,400	-	200	7,600	6,100	7,000	300	88,600
130105	MCH-FP Extension - Teknaf		38,500	4,700	-	200	4,900	3,900	4,500	200	56,900
130106	Community Training & Outreach - Chandpur		31,800	3,900	100	100	4,000	3,200	3,700	200	47,000
130200	MCH-Care Centre - Sirajganj		-	-	-	-	-	-	-	-	-
130300	Population Council Operation Research Activity		42,900	5,300	-	200	5,500	4,300	5,000	200	63,400
130400	Cholera Epidemic		-	-	-	-	-	-	-	-	-
130500	Studies on Rotavirus - Kenya		-	-	-	-	-	-	-	-	-
130600	DISC		37,700	8,000	9,900	15,800	33,700	9,200	30,000	2,800	147,100
130700	Centre for Diagnosis & Treatment of Diarrhoea in KSA		-	-	-	-	-	-	-	-	-
130800	Primary Health Care		-	-	-	-	-	-	-	-	-
14	STAFF DEVELOPMENT	3	50,400	6,600	-	600	600	22,000	8,800	-	89,000

SUMMARY OF MANPOWER PLANNING

1984

Program Code	Program Title	ADMINISTRATIVE LOCATION					BUDGETARY (CHARGABLE) LOCATION				
		Profes-sional	National	General Services	Project	Total	Profes-sional	National	General Services	Project	Total
	RESEARCH PROGRAM										
01	Disease Transmission	5	2	3	1	11	5	3	33	1	42
02	Pathogenesis & Therapy	6	3	4	-	13	6	6	23	-	35
03	Host Defense	4	1	1	-	6	4	2	10	-	16
04	Nutrition	4	3	40	26	73	4	3	43	26	76
05	Community Services Research	12[1/]	3	7	2	24	12[1/]	6	153	60	231
06	RESEARCH & TRAINING SUPPORT FACILITIES	2	12	390	150	554	2	3	174	93	272
07	TRAINING, EXTENSION & COMMUNICATION	4[1/]	5	16	3	28	4[1/]	5	16	3	28
08	MAINTENANCE & LOGISTICS	-	3	95	-	98	-	3	91	-	94
09	MANAGEMENT	9[1/]	4	99	1	113	9[1/]	4	96	2	111
10	RESOURCES DEVELOPMENT	2	2	1	-	5	2	2	1	-	5
11	MANDATORY COMMITTEE	-	-	-	-	-	-	-	-	-	-
12	EMPLOYEE BENEFIT	-	-	5	-	5	-	-	5	-	5
13	PROJECT DEVELOPMENT	-	-	26	100	126	-	-	42	99	141
14	STAFF DEVELOPMENT	-	-	-	-	-	-	1	2	-	3
	TOTAL OPERATING	48	38	687	283	1,056	48	38	689	284	1,059
15	NEW BUILDING	-	-	2	1	3	-	-	-	-	-
17	CAFETERIA	-	-	14	2	16	-	-	14	2	16
	GRAND TOTAL	48	38	703	286	1,075	48	38	703	286	1,075

1/Includes one position of Executive Secretary.

INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

PROPOSED 1984 PERSONNEL COST

(IN US DOLLAR)

Program Code	Description	Person Year	Regular & Project	Overtime	Consultants Honorarium	Total
	RESEARCH PROGRAM	400	2,754,500	35,300	-	2,789,800
01	Disease Transmission	42	472,600	7,000	-	479,600
02	Pathogenesis & Therapy	35	517,500	7,000	-	524,500
03	Host Defense	16	243,200	3,000	-	246,200
04	Nutrition	76	398,200	5,300	-	403,500
05	Community Services Research	231	1,123,000	13,000	-	1,136,000
06	RESEARCH & TRAINING SUPPORT FACILITIES	272	835,400	10,500	-	845,900
07	TRAINING PROGRAM	28	298,700	3,000	-	301,700
08	MAINTENANCE & LOGISTICS	94	254,100	4,000	-	258,100
09	MANAGEMENT	111	811,700	10,500	40,000	862,200
10	RESOURCES DEVELOPMENT	5	138,200	700	-	138,900
11	MANDATORY COMMITTEE	-	-	-	40,000	40,000
12	EMPLOYEE BENEFIT	21	42,400	1,000	-	43,400
13	PROJECT DEVELOPMENT	141	339,500	5,000	-	344,500
14	STAFF DEVELOPMENT	3	50,400 1/	-	-	50,400
	TOTAL:	1,075	5,524,900	70,000	80,000	5,674,900

1/ As per computer print $ 16,400 (for 3)
Additional 34,000
$ 50,400

ANTICIPATED INCOME FOR 1984

1982		1983 Original	1983 Revised	1984
3,031,503	UNRESTRICTED	4,567,000	3,303,600	3,882,500
163,133	Australia/ADAB	163,000	163,000	200,000
36,120	Bangladesh	37,000	35,000	35,000
-	Ford Foundation	200,000	-	-
200,000	Japan	625,000	200,000	425,000
100,000	Saudi Arabia	100,000	100,000	100,000
148,800	Sweden/SAREC	72,000	30,100	72,000
271,000	Switzerland	270,000	250,000	375,000
197,890	United Kingdom	200,000	175,500	175,500
1,900,000	USA/USAID	1,900,000	1,900,000	1,900,000
-	UNICEF/AGFUND	1,000,000	350,000	500,000
14,560	Other	-	100,000	100,000
1,614,512	RESTRICTED	3,315,000	2,782,800	3,115,600
75,000	Aga Khan Foundation	25,000	25,000	50,000
-	Belgium	75,000	75,000	75,000
-	CIDA/Rural Water Sanitation/WB	214,000	179,600	95,000
-	GTZ	56,000	56,000	50,000
-	France	60,000	60,000	100,000
71,335	IDRC/DISC	66,000	70,000	73,600
43,552	IDRC/Sanitation Impect	26,000	29,000	62,000
27,746	IDRC/Infant Mortality	-	7,800	-
-	Kuwait	400,000	-	100,000
110,722	SAREC/Immunity Vaccine	76,000	38,700	100,000
-	Saudi Arabia	618,000	424,800 1/	200,000
250,000	UNDP/WHO Clinical Research	350,000	250,000	225,000
75,901	UNDP/WHO Regional Training	75,000	75,000	85,000
332,990	UNFPA/DSS	426,000	426,000	-
58,925	UNFPA/MCH	66,000	66,000	66,000
20,836	UNICEF/Water & Sanitation	80,000	-	-
438,658	USAID/MCH-FP Extension	595,000	601,000	459,000
37,240	USAID/POP Council	83,000	86,900	-
-	USAID/Cultural Nutrition	24,000	12,000	12,000
	CIDA/DSS	-	-	1,063,000
-	UNICEF/ORS	-	300,000	300,000
71,607	Other	-	-	-
$ 4,646,015 2/	TOTAL	$ 7,882,000	$6,086,400 3/	$ 6,998,100

1/ $ 354,000 will be spent for operation of Saudi Project & $ 70,800 will available for Core Support to ICDDR,B.

2/ Less 1981 Fund in the amount of $ 672,373 received in 1982 and plus 1982 Fund amounting to $ 670,500 received in 1983. Therefore 1982 net income is $ 4,644,142.

3/ Plus $ 1,181,731 received from UNROB as interest free.

9/BT/ June 83

PROGRAMME REVIEW & EXTERNAL SCIENTIFIC REPORT

INTRODUCTION

As required by the ICDDR,B's charter, a biennial external scientific review was performed in 1982, followed by a further in-depth review by the Centre's Board of Trustees. The two reviews highlighted the Centre's successes and problems.

First, a seven-member External Scientific Review committee completed an intensive evaluation in two stages, ending in June. Then, 15 ICDDR,B Trustees independently analyzed the Centre's progress, relating their conclusions to those of the External Reviewers.

The following represents an attempt to integrate the two groups' major findings and suggestions, and to show how the ICDDR,B plans to integrate the most vital components.

Most important, the Trustees stated that, based on its recent performance, the Centre is at the forefront of research in several areas. This leadership position, the Trustees emphasized, should be fostered and should characterize all Centre programs -- even if some projects must be delayed or dropped to assure continued supremacy in major research domains.

Agreeing with this line of thought, the External Reviewers maintained that, "For the next few years a too great diversity in project orientation must be avoided. Only carefully chosen projects, within areas of present high priority, should be carried on or initiated."

PATHOGENESIS AND THERAPY WORKING GROUP

Assessing this program -- which concentrates on studying the pathogens that produce diarrhoeal disease, how the disease mechanisms work, and what effective treatments and preventives can be developed -- the reviewers said the scientific quality of PTWG projects is generally high, and that programs are competently executed.

Results of several studies, it was said, are of great practical importance -- particularly findings relating to cereal-based oral rehydration solutions (ORS); and those involving an understanding of such diarrhoeal disease mechanisms as cholera-induced toxin secretion, and its possible control with anti-secretory drugs.

Also highly praised was the ICDDR,B's excellent animal laboratory facilities -- one of the world's finest -- for on-going pharmacological and physiological experiments. The Centre, it was said, is better suited for animal studies than many other research facilities, because here such studies can be done at much less expense than is feasible in any laboratory in a developed country. It was recommended, however, that these facilities be more heavily utilized to test clinical and physiological ideas.

Also lauded was the quality of the Centre's biochemistry laboratory, and the recent introduction of external quality control.

--As to the reviewers' suggestion that the animal testing facilities be more fully utilized, PTWG scientists already have begun expanding their studies in this direction. For example, they have begun searching for models mimicking such severe diarrhoeal disease complications as hemolytic uremic syndrome and hypoglycemia. Other projected studies will involve animal models of colonic absorption and the testing of anti-secretory drugs.

The reviewers gave special attention to two broad groups of proposed future studies deemed important. For the first time, relating to the clinical aspects, prevalence and nutritional consequences of rotavirus-caused diarrhoea, it was suggested that a more ambitious epidemiological study should be done.

--Responding to this suggestion, PTWG researchers have conferred with their colleagues in the Disease Transmission Working Group, which is focusing on field studies of rotavirus infection.

As to the second group of studies, relating to chronic diarrhoea, the reviewers felt that the ICDDR,B's diagnostic and clinical facilities, as well as patient care, must be upgraded, before any ambitious studies on this very important subject are attempted.

Along these lines, ICDDR,B facilities already have improved significantly, with the opening in March of the new treatment centre-cum-research facility. As a result, endoscopy with colonoscopic biopsies are being carried out, and the histopathology-postmortem service has been upgraded.

Finally, the reviewers suggested a decreased emphasis on antibiotic testing, and increased attention to "treatment", as opposed to pathogenesis research.

--Heeding this advice, the PTWG only has one antibiotic trial in progress. And several novel approaches are being tried in use of ORS and of bovine colostrum antibodies. New (PTO) antisecretory approaches to be tried include loperamide and berberine.

NUTRITION WORKING GROUP

The Nutrition Working Group was described as a well organized, coordinated and productive team, judging by its various recent publications, documents and by the evaluations of scientists visiting the Centre. NWG scientists were said to be "ambitious" and to be "contemplating priorities difficult to rank in view of relevance." However, one reviewer continued, "knowing the Group's scientific contribution in the last three years, in elucidating diarrhoea's role in the deterioration of nutritional status, further contributions are to be expected. Furthermore, the demonstration of simple interventions to curtail infection and diarrhoea and to reduce the risk of death, suggest that the NWG will yield other benefits in the future."

The program's objectives for 1983-5 were described as clear, in that they address the nature and determinants of the diarrhoea-malnutrition cycle, and aim to eventually control and prevent it. Moreover, the reviewers said, current NWG plans take into account Bangladesh priorities -- which are similar to those of many other less developed countries -- with an aim toward generating results applicable the world over.

Specifically, the reviewers praised NWG scientists for the valuable data generated by their "excellent clinical/metabolic studies over the past decade," done with relatively simple clinical study set-ups. They cited the Group's work with prolonged malabsorption, especially of nitrogen; its findings relating to nutrient absorption, and metabolism in various dietary regimes, which "may lead to optimum dietary intervention, and may help interrupt the diarrhoea-malnutrition cycle;" the development of an effective rice powder electrolyte solution for oral rehydration therapy; and the discovery of adequate vitamin A absorption during the course of diarrhoeal disease.

Much of this work, it was said, has potential immediate application to solving common problems in the developing world. Moreover, the work was said to be directly relevant to WHO's Global Diarrhoeal Disease Control program.

As more and more ambitious metabolic studies are attempted, the reviewers said, the physical set-up for patient care and clinical research should be substantially improved. This effort, it was said, should include manpower development at all levels, e.g. clinical technicians, nursing staff etc., to be developed from within the Centre. Also needed is a metabolic kitchen.

These metabolic studies, the reviewers said, should receive high priority over the next five years, since the resulting data will be both scientifically interesting and of great practical value.

---Agreeing with this assessment, NWG scientists are developing new studies oriented toward answering many practical questions relating to metabolism. To support these studies, a new metabolic ward and kitchen already are in place, though more equipment and training of personnel is needed.

Turning to other suggestions for the future, the reviewers said NWG scientists should expand their original observations about the negative effects on nutrition of diarrhoeas caused by cholera, rotavirus, E. coli and Shigella, to include the damage done by other enteric pathogens.

---Responding, NWG researchers already have begun studying Giardia, and are about to begin one on Cryptosporidium. Future studies are planned of Campylobacter, Strongyloides and Fasciolopsis Bushki.

As to the nutrition field studies at the Centre's Teknaf out-station, the reviewers noted that these are of an ecologic nature, and involve the systematic

collection of data on growth, morbidity, nutrition and survival of children. Complementing this are unique microbiologic studies of intestinal pathogens, as well as census and nutrition data on the general populace, especially mothers.

Due to the Teknaf studies' longitudinal nature, and to the data's magnitude and complexity, the reviewers pointed out, analysis has been limited. It mainly has dealt with the effects of interventions (principally ORT) on diarrhoeal attacks and survival. These studies, the researchers noted, have shown, among other things, that free distribution of ORS packets has had a dramatic positive effect on mortality.

Now, however, the reviewers contended, other analyses are expected; the inter-relationships among intrauterine growth, maternal morbidity and nutrition, breast feeding and weaning, diarrhoeal disease and nutrition and growth.

--- Agreeing with the need for more in-depth analyses, NWG researchers plan in 1983-5 to focus on relations of diarrhoea to wastage and stunting, while taking into account such factors as fetal maturity, breast-feeding and the nutrient value of food supplements. Such analysis is expected to provide answers relating to the natural history of growth retardation, the risk of malnutrition and the on-set of severe protein-energy malnutrition.

Finally, the reviewers said that another important aspect of nutrition deserving immediate attention relates to weaning foods: how to develop a means of safely preparing them at home and keeping them contamination-free-- and then how to transfer this information to target populations. To accomplish this goal, the reviewers said, the NWG needs to recruit a dietician and a food chemist.

Responding to this suggestion, the NWG already has begun a research-cum-action project aimed at developing weaning foods that can be safely prepared at

home and kept contamination-free. Such foods also would be culturally acceptable and affordable to low-income people.

In concluding, the reviewers described the NWG as a multidisciplinary team of young scientists, strongly biomedical, but with the benefit of two anthropologists. However, they said, the group lacks and needs an epidemiologist, a data analyst and a dietician-nutritionist.

In the last analysis, the reviewers lauded the NWG, saying that "the coherence, dedication and productivity of the Nutrition Working Group speaks highly of the Centre's success in promoting national development, as expressed in the creativity of good and relevant science by this group of Bangladeshi workers."

HOST DEFENSE WORKING GROUP

As the reviewers noted, the Host Defense Working Group's program for 1983-5 focuses on how the local immune system of the gut responds to the pathogens that cause diarrhoeal diseases, and how the immune response can be stimulated by vaccination to confer protection against diarrhoeal diseases.

Top priority has been given by this group to studying how the body can be induced to produce antibodies to enteropathogens and their diarrhoea-causing products. To accomplish this, the HDWG has three planned protocols:

a. Studies involving the possibility of oral vaccination with purified or complex immunogens that, hopefully, would cause an optimal mucosal immune response;

b. Immunization of mothers, leading to the production of increased breast milk antibodies against specific pathogens, and evaluation of how much protection this may offer a breast-fed child;

c. Attempts to use gastric acid as a protective barrier against gut infection.

In addition, secondary priority has been given to:

a. Learning more about the workings of the immune system -- by challenging laboratory animals' immune systems (especially those of mice) with, say, live cholera bacteria;

b. Studying the possibility of providing "passive immunity" to, say, cholera by inducing cows to produce high levels of cholera anti-toxin, which are secreted in the cows' "colostrum", or early milk.

c. Investigating the effect of malnutrition and intestinal parasites on gut immune responses to oral vaccines.

While lauding these goals, the reviewers felt that, given the Group's operating realities, for the next few years, too great a diversity in project orientation must be avoided -- and that only carefully chosen projects, in high priority areas, should be undertaken.

Basically, the reviewers said high priority should be given to studies of local intestinal immunity, in relation to infection with live or dead vaccines -- leading to the development of protective immunogens.

Overall, it was said, the HDWG is hampered by several missing factors -- most notably the lack of a senior scientist specializing in gut immunology (or at least medical immunology); as well as an "almost non-existent working group." Here too the problem is insufficient scientific personnel.

Given these realities, the reviewers said, for the immediate future existing colloboration, with visiting and outside immunologists, must be expanded and maintained, even when a senior immunologist comes on board.

In addition, the reviewers said, the HDWG also needs at least one clinical investigator or physician with a full-time research interest in gut immunology -- a field where "the Centre has a much stronger possibility of being first-rate than in basic cellular immunology."

Moreover, it was suggested that attempts should be made to attract to the HDWG researchers from other groups, who would become associate members of Host Defense, and would participate in protocols to improve the current scientific staff deficiency.

As to the Group's research support staff, the reviewers found them to be "competent in most of the methods recently used in the HD program laboratories."

Finally, the reviewers noted that the HDWG's projects would be significantly strengthened with the addition of at least four pieces of equipment: a -70 degrees deep freeze; a mini-computer; a water bath, and a microbalance.

--Responding to the reviewers' comments, the HDWG is planning to recruit a senior immunologist from Czechoslovakia, and to strengthen the immunology laboratory. Studies of gut immunity against Shigella is a new area chosen for investigation in 1983-4.

COMMUNITY SERVICES RESEARCH WORKING GROUP

Reviewing the Centre's largest program in terms of budget, the External Reviewers and the Board of Trustees mostly had praise for the Community Services Research Working Group (CSRWG) -- tempered by some suggestions for improvement.

Overall, the reviewers lauded the ICDDR,B for being an enormously important source of demographic data and research over the past 20 years -- noting that at Matlab the Centre maintains the Demographic Surveillance System (DSS) -- the largest continuous system of accurate vital registration for any sizeable population in a developing country.

The Centre's contribution to improved understanding of population change determinants in a developing country, the reviewers said, probably exceeds that of any other single locale or country. Moreover, there are few demographic issues that research based on ICDDR,B data has not helped clarify. The most notable recent achievements: the extension of demographic surveillance and certain health interventions to Teknaf, an area at Bangladesh's southeastern tip that is vastly different ecologically from Matlab; and the clear documentation of a major fertility decline in the Matlab treatment area, induced by an expanded family planning-cum-highly focused primary health treatment effort.

Maintaining that the state of present staff, facilities and work programs, in general, seems quite healthy, the reviewers addressed some strong points and problems:

1. As to the CSRWG's major project, the DSS, the reviewers said:

Data appear to be of high quality in terms of completeness; and accuracy of characteristics is good and improving. Field staff are very

experienced, and take great pride in keeping records complete. All aspects of data recording appear to enjoy a high degree of quality control. Successful implementation of computerization of records in the IBM System 34 has been undertaken. Improvement of cause-of-death reporting by non-physicians is well under way.

However, the question rose whether, by reducing the number of household visits, the DSS could be made simpler and less costly, without sacrificing accuracy. This would be especially important if the system were to be used successfully in other countries.

--Noting that some relevant data on this issue already exist, the ICDDR,B plans that high priority be given to researching these issues in 1983-5.

2. Another major part of the CSRWG's efforts revolves around evaluation of family planning-cum-health intervention experiments at Matlab. There, the effects of "treatment" versus "comparison" area services are studied.

Thus, in the treatment area, intensive maternal-child health/family planning (MCH/FP) services are provided in people's homes, and/or at the Matlab Treatment Centre or one of four sub-centres in the treatment area. Offered are oral rehydration therapy (ORT) and, if necessary, intravenous rehydration for diarrhoea victims; immunizations against measles and tetanus; other primary health care treatments, such as for scabies and respiratory infections; pre- and post-natal care; health education; and provision of contraceptive advice, devices and follow-up.

On the other hand, in the comparison area, only ORT is offered in people's homes -- though residents can go to the Matlab Centre for diarrhoea treatment, contraceptives and primary health services.

This experiment, the reviewers said, appears to have been done with great care and attention to detail. A high quality field staff and a tight supervision/monitoring system exist. Family planning appears to be a great success, with crude birth rates declining by about 10 per 1,000 more in the treatment than in the comparison area, or by 25 percent. Moreover, crude death rates dropped by 2.5 per 1,000 more in the

treatment area, or some 20 percent.

Equally impressive, it was said, is a highly reliable project evaluation apparatus, which lends weight to estimated results. As the principal CSRWG external reviewer stated, "The Matlab experiment is the best-documented, and scientifically most satisfactory example of family planning program evaluation in a developing country".

In an important critique, it was stated that careful thought is required about what ideas should be tested next, using the large, intensive Matlab data collection effort. To do this sensibly, it was noted, analysis of current data is needed.

--Agreeing, the Centre responded that a new computer facility is very badly needed. Further, assistance for the development of morbidity surveillance on a consultative basis already has been planned.

3. In addition to those noted above, reviewers pointed out that several research areas are ripe for intensified activities. Enlistment of a health economist to evaluate the cost-effectiveness of various health interventions at Matlab seems clearly desirable. Also, the data could be used to address some major issues in population economics. The successful family planning effort, combined with the excellent data system (including a 1982 Census of socioeconomic status and wealth) affords a unique opportunity to measure, for treatment versus comparison areas, the family planning program's economic impact on incomes, labor force participation, and levels of physical and human capital. Every effort should be made to capitalize on the uniqueness of the Matlab data and the experimental interventions whose results are being registered in that data, the reviewers said.

--The CSRWG also sees the recruitment of a health economist as a high priority.

4. The reviewers also noted a "conspicious lack" of small-scale socio-anthropological studies, designed to establish sound hypotheses, which could be tested to get specific answers to important issues.

--Concurring with this need, the CSRWG has begun a series of in-depth, rather than longitudinal or cross-sectional studies -- including what possible role a mother's education may play in lowering child mortality; and whether a "plateau" is reached in terms of people accepting health interventions in family planning and oral therapy, etc.

5. With regard to possible extension of the present CSRWG program, the reviewers pinpointed a "severe" weakness in the health services research. Most ICDDR,B health projects, it was noted, were being done outside CSRWG auspices; and the Group's main thrusts principally have been demographic and socioeconomic. A major concern was that these projects will "compromise the Centre's unusually high data quality and research design standards."

The reviewers noted that extension of the Matlab type MCH-FP programme to two new thanas has been implemented initially under the auspices of the Training and Extension Working Group, and then under the Project Development Committee. The major aim is to test the belief that the Matlab approach can be successfully used elsewhere, by suitably training workers in the government health system. It was felt that the highest priority should go towards developing leadership in health services and operations research, in order to fully realize the assets of the Centre's very good demographic base.

6. Furthermore, the reviewers said the CSRWG does not give much priority to controlling diarrhoeal diseases, but should be helping the Bangladesh Government in this campaign. Finally, it was said that demography and health services

research should be integrally related in the future.

-- The ICDDR,B's response was that, in the coming year, more emphasis will be given to this area, through the recruitment of a medical epidemiologist to replace the field coordinator who left the Centre last year. Integration of the extension health services within the CSRWG is planned. With regard to diarrhoeal diseases, the CSRWG has undertaken and evaluated one of the largest Oral Therapy studies in the world, and also has provided consultancy services to BRAC Oral Therapy program conducted in several districts in Bangladesh.

DISEASE TRANSMISSION WORKING GROUP

Overall, each project was felt to be of high quality and the program was seen as very productive. However, the DTWG's program and priorities were seen as a compilation of various projects, resulting from past ICDDR,B experience and individual interests, lacking in overall conceptual focus.

The reviewers and the Board of Trustees as a whole accepted the program as presented as a basis for 1983 research activities. During the year, the Board said, there must be modifications, leading to a well-conceived, well-focused program of sound priorities for 1984. This new program plan is to be presented to the Board by June 1983.

To develop such a sound program, it was said, the DTWG should be assisted by a consultant experienced in diarrhoeal disease epidemiological research. In designing a new program priority, research areas should be defined for 4-5 years. And the following approaches should be taken into consideration in setting these priorities:

a. Diarrhoeal disease causes by specific pathogens, taking into account what is known and unknown about the etiology, pathogenesis, epidemiology and ecology.

b. Regarding the affected communities, attention should focus on groups at special risk (high or low). Also, social, economic, behavioral and environmental factors important in the spread of diseases should be addressed.

c. Successful diarrhoeal prevention and control interventions should be reviewed -- such as human behavior, particularly hand washing; and such technological interventions as immunization. Attention to present knowledge is essential in the setting of priorities, the reviewers said; and special attention should be paid to priorities set by WHO, and these priorities should be consciously incorporated or rejected, for explicit reasons. Finally, the programs should focus on the situations in Bangladesh and in other countries which have the greatest problems.

In addition, there was strong consensus that the Centre urgently needs to recruit a junior and senior epidemiologist, as well as a senior microbiologist. Special attention should be given, the reviewers said, to taking a research advantage of such unique situations as when a cholera epidemic strikes a defined population, such as that at Matlab.

--- Responding to this critique, ICDDR,B leaders believe the program has been successful in identifying the mode of transmission of important enteric pathogens. Simple interventions, such as hand washing, have been proven effective, and now are being applied on a broader scale to prevent the spread of a variety of pathogens. Basic studies relating important phenomena, such as antibiotic resistance or invasiveness, to the clinical or field situation have attracted attention. This work followed an early, in-depth review and recommendation by Dr. J. Hughes, a senior epidemiologist in diarrhoeal diseases from the CDC, when he visited the ICDDR,B in 1981 on a consultation. The proposed program and priorities were prepared by etiology, taking into consideration the state of current knowledge for such enteropathogens. Dr. Hughes reviewed studies from 1960 to 1980, and emphasized the need to investigate each enteropathogen with proposed study design, to fill in gaps in knowledge.

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It is agreed that the Centre urgently needs a senior epidemiologist, as well as younger scientists with high skills in enteric and field epidemiology. The assistance of a senior epidemiologist will be very helpful in improving the program.

TRAINING AND EXTENSION

The reviewers agreed overall that the Training Program had achieved a great deal in its first three years. Among its major accomplishments, said the reviewers, were "vigorous attempts to train local staff that have met with considerable success, among both research and support staff."

Noting that the Centre possesses certain unique qualities as an international institution, the reviewers said these strengths should be capitalized on by the Training Program -- in order to better train individuals from other countries as well as from Bangladesh. While this already is being done, it was felt that such efforts could be greatly enhanced, by more sharply focusing on overall conceptual goals, and on how and where to place priorities. To reach this goal, the reviewers suggested the following guidelines:

1. Increased specificity in both courses and other training activities. Special training areas should correlate with activities the Centre excels in, and where a practical field, hospital or bench experience is available. For example, it was said, instead of a course on field epidemiology, one on the spread and control of cholera should be given.

2. Training outside Bangladesh should be specific and limited to the expertise of Centre staff. With the concurrence of the Board of Trustees, larger projects can be developed in conjunction with other countries. However, these would be entirely contingent on external funding.

3. With time, there should be decreased dependency on imported teachers. The training program, it was felt, now is mature enough to do much of

its work with internal faculty.

4. There should be active internal and external evaluation of all training, including good follow-up of what each trainee does in subsequent years. Based on this, sharper criteria for selecting participants can be developed.

5. A serious plan is needed to present upgrading experiences for previous trainees. These would serve as current "state-of-the-art" courses for some selected new trainees. Such courses might be termed "Advances in Diagnosis, Management, etc. of Diarrhoeal Diseases." The focus should be on specific areas, such as new treatments for diarrhoea, nutrition during and after diarrhoea, ORS improvements, etc.

6. Participants chosen should be sharply defined, such as "professors of pediatrics for advances in ORS," or "chiefs of emergency and OPDs" for approaches to epidemic management, using the Dhaka treatment centre as a model.

7. Increasing emphasis should be placed on preparing outstanding persons for research careers in their own countries.

Furthermore, there was consensus that the Centre should not develop a core of people who exclusively do training or teaching. It is important, it was said, to keep all research staff participating in training, within reasonable time limits, perhaps 20 to 25 percent of total working time. This commitment should be emphasized in recruiting new staff, the reviewers said.

Another strong consensus was that there should be a far greater internal training effort for younger staff. As part of this, it was said, more attention must be paid to the basic quality of the laboratories, hospital and all other facilities. It was noted that a strong upgrading is needed in microbiology, the hospital and treatment centre, as well as in the field stations.

On a broader scale, the reviewers supported the concept of regional conferences, such as the Asian Conference, as a forum for younger scientists to present their findings and thereby gain experience.

As to preparation of training materials, it was said that the present weakness could be overcome by use of short-term consultations and WHO materials, particularly relating to the standardization of laboratory methodology. In developing training materials over the long term, the reviewers stated, there should be a concerted effort to develop the intrinsic capabilities of current staff. It was noted that the Centre has a great strength in graphics and all the components for an excellent ability in materials development.

Turning to extension activities, the reviewers noted that plans are underway for the Centre to extend some of the elements of its maternal-child health/family planning program from Matlab to three other areas of Bangladesh. These areas have been designated as targets for special health care by the Bangladesh Ministry of Health. It was said that the Centre has an opportunity to export its research findings to these areas, in close collaboration with both the Bangladesh Government and with semi-autonomous and private organizations engaged in health care delivery. This does not mean, the reviewers said, that the Centre should run the country's health delivery services, but should assist in measuring their impact.

-- Responding, the Training and Extension Group said it is taking steps to implement the reviewers' suggestions.

SCIENTIFIC COLLABORATION

In respect to collaboration, which currently encompasses virtually every area of the Centre's activities, the reviewers noted that "this should continue to be encouraged as long as it serves the aims and objectives of the Centre". Collaborative research of the Centre with other institutions should primarily reflect ICDDR,B priorities. ICDDR,B is a valuable resource and has a potential role in assisting governments wanting to establish their national diarrhoeal disease research centres.

The Board observed that largest projects can be developed in conjunction with other countries. These projects would be contingent on external funding. Other reviewers recommended that outside researchers coming to the Centre in a collaborative effort should be assigned counterparts, who should be chosen for their interest in the subject. The counterparts thus would benefit by gaining research or clinical experience. At the same time, they would also be of immense value to the outside researchers.

--In the December 1982 Board of Trustees meeting, it was noted that most collaborative projects, including all of those being undertaken now, are fully costed and overheads are being recovered.

Reviewers commented that in 1981, of sixteen collaborative research protocols only two are with institutions and organizations in Bangladesh. The reviewers said, there was scope for greater collaboration with many more Bangladeshi institutions. In the health services field, it was stated, the Bangladesh Ministry of Health is an obvious partner. Moreover, where joint research projects are involved, the reviewers said, several university, government, semi-autonomous and private institutions and organizations are likely to be interested--providing the Centre is prepared to spend money and considerable effort.

In the medical field ICDDR,B "is probably by far the most powerful research institution" in Bangladesh. The Centre should support development of research capabilities in Bangladeshi institutions. The reviewers noted that this may go a long way toward building up ICDDR;B's credibility in the Bangladesh point of view.

-- Agreeing with the reviewers' point, the Centre took a major step in 1982, aimed at vigorously pursuing development of research capabilities in Bangladesh as mandated in the ICDDR,B Ordinance. The Centre's Board of Trustees formally established a Project Coordination Committee, whose goal is to "coordinate, strengthen and facilitate research by Bangladeshi organizations". The Centre has begun cooperation with the Bangladesh Medical Research Council to establish a research cell to train Bangladeshi scientists in research and management of diarrhoeal diseases. Currently collaborative studies and assistance projects are ongoing with more than 50 national institutions.

"ICDDR,B's scientific research is of excellent quality and of great significance to the acquisition and spread of new knowledge about diarrhoeal diseases. There is every reason to believe that the work of scientists at ICDDR,B, which has in the past revolutionized thinking about these diseases, will continue to contribute to the search for ways to address this critical public health problem."

CONCLUSION

The completion of the first cycle of external review, coupled with the Board of Trustees' own thorough analysis of the Centre's work, has provided excellent guidance for strengthening the ICDDR,B and for setting the goals and priorities that will be the foundation for the next five-year plan. The work being done in 1983 represents the fourth year's effort in the present five-year plan -- a plan which was presented to the Consultative Group meeting in 1980. At the Consultative Group meeting of 1984 we hope to present our plans for the period 1985-1990.

9a/BT/June 83

VACCINE TRIAL

WORLD HEALTH ORGANIZATION

DIARRHOEAL DISEASES CONTROL PROGRAMME

DEVELOPMENT AND FIELD TESTING OF AN ORAL CHOLERA VACCINE AT THE INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH (ICDDR,B)

Report of an Informal Consultation
(Washington, DC, 10-11 June 1983)

1. INTRODUCTION

The purpose of the consultation was to discuss the development and field testing of an oral cholera vaccine at the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B).

The participants included scientists who had developed two candidate cholera vaccines, members of the ICDDR,B Board of Trustees, the Director of the ICDDR,B, members of the Steering Committee of the WHO Diarrhoeal Diseases Control (CDD) Programme's Scientific Working Group on Bacterial Enteric Infections, outside experts, and members of the WHO Secretariat (see Annex).

The consultation focused in particular on two experimental oral cholera vaccines, namely: JBK-70, a live A^-B^- mutant of Vibrio cholerae El Tor Inaba (strain N16961) developed at the University of Maryland, USA, and a combined B-subunit/whole-cell vaccine, developed by the University of Göteborg, Sweden, the National Bacteriological Laboratory, Sweden, and the Institut Mérieux, France.

2. REVIEW OF THE CANDIDATE ORAL VACCINES

2.1 JBK-70

The present status of this vaccine was reviewed although, for reasons given below, it was not being considered for a field trial.

JBK-70 is a genetically engineered strain of V. cholerae constructed specifically for possible use as an oral-attenuated cholera vaccine. Using the techniques of recombinant DNA, the genes encoding cholera toxin were cloned from the V. cholerae El Tor Inaba strain N16961, a strain which has been extensively studied in volunteers and shown to produce both disease and immunity. The genes encoding both the A and B subunits of cholera toxin were specifically and completely deleted in vitro by the use of restriction endonucleases, and a gene encoding mercury resistance was inserted in their place. This mutation was then reinserted into the chromosome of N16961, displacing (and thereby deleting) the cholera toxin genes of that strain. Because this mutation involves a complete deletion of the structural genes for cholera toxin, the attenuated strain is incapable of genetic reversion and of becoming toxinogenic. The mutation is also specific in that no other genes encoding colonization factors or other antigens important for immunity were altered.

In initial volunteer studies carried out at the Center for Vaccine Development in Baltimore, USA, 14 volunteers were given 10^6, 10^8, or 10^{10} organisms of JBK-70. Mild to moderate diarrhoea was observed in 1 of 4, 2 of 5, and 4 of 5 volunteers, respectively. Stool volumes ranged from 235 to 1878 ml and cramps were reported in all volunteers with diarrhoea; one volunteer had some rice-water stools. Other side reactions included anorexia (5 volunteers), vomiting (1 volunteer), and low grade fever (100°F in 2

volunteers). All but one of the 14 volunteers excreted JBK-70 in their stool. The antibacterial (vibriocidal) immune response observed in serum was comparable to that seen after challenge with pathogenic V. cholerae and was much higher than that observed with 3 doses of the B-subunit/whole-cell vaccine.

Although the results in volunteers were encouraging with regard to colonization and immune response, the number of reactions observed at the doses tested (10^6-10^{10} organisms) was unacceptably high. Additional volunteer studies using fewer organisms (10^2-10^4) per dose of vaccine are planned to see whether they will be adequately immunogenic without being reactogenic. Research is also under way to identify the factor(s) responsible for the observed diarrhoea and to clone the genes encoding this factor. Once cloned, these genes can be specifically deleted from JBK-70 in the same manner as the cholera toxin genes to produce, it is hoped, a highly effective, inexpensive and non-reactogenic live cholera vaccine.

2.2 B-subunit/whole-cell vaccine

The present composition of this vaccine (Table 1) is designed to provide sufficient amounts of the most suitable antigens currently available for evoking intestinal mucosal antitoxic and antibacterial immunity to protect against V. cholerae. Experiments in rabbits have shown that antitoxic and antibacterial antibodies act synergistically in protecting against experimental cholera. Protective antitoxic antibody is mostly directed against the B-subunit, whereas antibacterial immunity is mainly against the cell-wall lipopolysaccharide (LPS). Antibodies against heat-labile antigens, such as haemagglutinins, may also contribute to protection. All these various antigens are included in the vaccine. The vaccine is intended for oral use because current knowledge about intestinal immunology, supported by experiments in humans with this vaccine, indicate that the oral route is superior to the parenteral route for stimulating the formation of secretory IgA (SIgA) antibody in the gut mucosa and local immunological memory. The procedures for preparation and characterization of the vaccine are well defined, thus assuring good batch-to-batch reproducibility.

Vaccine safety: Initial studies in Sweden and Bangladesh demonstrated that the vaccine, given orally, caused no detectable side-effects. In the studies in Sweden, 10 adult volunteers received one or two doses of vaccine containing 0.5 mg of B-subunit and 5×10^{10} organisms of the heat-killed classical Inaba and Ogawa vaccine components (Table 1). In no instance were any local or systemic side-effects observed within one month after immunization. In subsequent studies, 30 adult Swedes and 16 Bangladeshi women were given two doses of vaccine each containing 0.5-2.5 mg of B-subunit and 5×10^{10} of the heat-killed classical Inaba and Ogawa vibrios. Surveillance for side reactions was performed for 10 days after each immunization by a physician or a health worker; in no instance did these oral immunizations give rise to any detectable side-effects.

In more recent studies in Bangladesh, one or two doses (given one day apart) of 1 mg or 5 mg of B-subunit alone were given orally to about 1 200 family contacts (aged 1-70 years) of patients with cholera to evaluate its possible effectiveness as a toxin-receptor blocking agent. No local or systemic side-effects were observed.

Mucosal immunogenicity and serum antibodies in volunteers: At the ICDDR,B and in Sweden, mucosal immunogenicity studies have provided information on the ability of the vaccine to stimulate mucosal antibody in the

intestine of volunteers. The whole-cell vaccine used in these studies consisted of the heat-killed classical Inaba and Ogawa vaccine components (2.5×10^{10} organisms of each per oral dose) of the presently proposed vaccine (Table 1). Three groups (I-III) of 8-9 healthy Bengali women were given 2 oral or 2 intramuscular doses of vaccine 28 days apart and were compared with one group (9 persons) of cholera convalescents given a single oral vaccination. The vaccine doses given are indicated in Table 2. Five minutes before the oral immunization 100 cc of 0.1 M $NaHCO_3$ solution was given to neutralize gastric acidity; the oral vaccine was then administered in 100 cc of the same solution. Intestinal lavage was performed and fluid specimens were examined 0, 3, 9, and 28 days after each immunization, or (for cholera convalescents) 9 and 28 days after the onset of disease. Antitoxin and antibacterial antibodies in the lavage fluids were measured by an ELISA test using purified cholera toxin and LPS, respectively, as solid phase antigens. Total IgA was also determined by ELISA to permit the expression of all titres in relation to total IgA.

The results showed that a single peroral administration of 2.5 mg of B-subunit induced a significant increase in antitoxin titre in most recipients (Figure 1 and Table 3). Two immunizations with a 0.5 mg dose of B-subunit also induced a significant mucosal antitoxin response in most instances. Although intramuscular injections also induced a rise in the antitoxin IgA titre in many cases, the duration of the response was significantly shorter than after oral administration. The study thus showed the ability of B-subunit, administered orally, to stimulate intestinal mucosal antitoxin responses in Bangladeshi adults.

Measurements of the intestinal mucosal antibacterial antibody response revealed that although clinical cholera induced a substantially increased titre of intestinal IgA antibody to V. cholerae LPS in most recipients, increases occurred less frequently and were of lesser magnitude following a single oral or intramuscular vaccination with whole-cell vaccine (Figure 2 and Table 3). However, following the second oral administration of the whole-cell vaccine, intestinal antibacterial responses were induced that were comparable to those following disease in 12 out of 13 vaccinees. Both the magnitude and the duration of the mucosal response attained after two oral administrations were superior to those obtained by the 2-dose parenteral immunization regime.

As its final objective, this study explored the extent to which immunization could induce (or, in the naturally-primed Bangladeshi volunteers, perhaps boost) immunological memory for a mucosal response. Oral immunization with combined vaccine appeared to be as effective as clinical cholera in preparing the intestine for a local IgA antibody response to restimulation by cholera antigens. Both the antitoxin and the anti-LPS responses were seen within 3 days after the second immunizations, which was earlier than in the case of the initial vaccinations (Figs. 1 and 2). As regards the mucosal IgA antitoxin, a rapid response was also seen in many volunteers who had been vaccinated with B-subunit 15 months earlier, suggesting that antitoxic memory was long-lasting.

The SIgA antitoxin and anti-LPS antibody responses in intestinal lavage specimens following one or two immunizations with similar doses of combined vaccine were also studied in adult Swedish volunteers. Significant titre increases of both antibodies were observed in most vaccinees, but they were about 50% lower than those observed in Bangladeshi volunteers.

Challenge studies: Studies of vaccine efficacy were recently performed at the Center for Vaccine Development in Baltimore, USA. Nineteen adult volunteers received 3 oral doses of combined vaccine at 2-week intervals. Each dose of vaccine consisted of 5 mg of B-subunit and 5×10^{10} heat-killed classical Inaba, 5×10^{10} heat-killed classical Ogawa and 1×10^{11} formalin-treated El Tor Inaba organisms - i.e., the first three components of the whole-cell vaccine (Table 1). Three hours prior to ingesting vaccine, the volunteers ingested 300 mg of cimetidine; one minute before vaccination, they took 2 g sodium bicarbonate in 150 ml of distilled water. Antibody responses in jejunal fluid and serum were measured after each immunization. Five weeks after the last immunization, the susceptibility of 11 vaccinees to oral challenge with 2×10^6 live El Tor V. cholerae organisms (strain N16961) administered with 2 g sodium bicarbonate was compared with that of unimmunized control volunteers.

No notable adverse reactions were observed in any vaccine recipients. The results of the challenge studies (Table 4) showed that the vaccine gave significant protection against an ID_{100} challenge dose with live vibrios: 4 of 11 vaccinated persons as compared with 7 of 7 controls developed diarrhoeal illness after challenge (64% vaccine efficacy, $p = 0.01$). The vaccination afforded complete protection against severe disease; no vaccinee had diarrhoea exceeding 1 litre, while 4 of 7 controls had diarrhoeal stools of 2 litres or more (Table 4). The vaccine had no effect on the rate of excretion of V. cholerae organisms, though the quantity of excreted organisms was slightly less in the vaccinated group (Table 5).

Seventeen of 19 vaccine recipients manifested significant rises in serum vibriocidal antibody (measured against Inaba serotype). There was no relationship between serum vibriocidal responses and protection against diarrhoea among the 11 vaccinees who participated in the challenge study. Three of 4 vaccinees who developed illness and all 7 protected vaccinees had significant rises in vibriocidal antibody during and after vaccination.

All 19 vaccinees exhibited significant serum antitoxin responses following vaccination and 13 vaccinees (68%) had significant rises in intestinal SIgA antitoxin measured after only two doses of vaccine. There was no correlation between serum or intestinal antitoxin responses and protection.

Measurements of intestinal antibody to Inaba LPS and outer membrane proteins are in progress. Preliminary work has revealed significant rises in SIgA anti-LPS in intestinal fluids from about half of the vaccinees.

Possible field trial: On the basis of these results consideration can now be given to a field trial of the B-subunit/whole-cell vaccine. The main purpose of such a trial should be to determine the protective efficacy of the vaccine against cholera and the duration of protection. However, given the particular nature of the vaccine, consideration should also be given to detecting any possible cross protection afforded against Escherichia coli LT disease by the B-subunit component of the vaccine. The opportunity should also be taken to study the protection of infants via "immune milk" from vaccinated mothers, as well as prevention of the carrier state (asymptomatic infection).

3. FIELD TEST FACILITIES AT ICDDR,B

The ICDDR,B has the capabilities for field testing a cholera vaccine. The part of the field area in Matlab Thana that is fully covered by the health services has a population of 80 000 and is immediately available for such a field trial. Additional field areas may be made available, if needed, provided sufficient resources are forthcoming. It was felt that in designing such a trial, it would be important to ensure that each cell is large enough to provide definitive information about the efficacy of the vaccine tested.

4. FUTURE STUDIES WITH B-SUBUNIT/WHOLE-CELL VACCINE - CONCLUSIONS AND RECOMMENDATIONS

The following are the conclusions and recommendations of the Group regarding future studies to be undertaken with the B-subunit/whole-cell vaccine, based on its review of the above information:

(1) The Group considers that the B-subunit/whole-cell vaccine offers a novel approach to protection against cholera. It notes that the vaccine has been shown to be unquestionably safe and immunogenic (i.e., has the capability to evoke antibodies) in volunteers in Bangladesh, Sweden and the USA. The Group also recognizes that it is difficult to predict the efficacy of the vaccine in a population in which cholera is endemic based on the efficacy observed in American adult volunteers (64%); in naturally primed individuals protection is in fact likely to be greater than in unprimed volunteers.

(2) The Group recommends that the highest priority be given to the following three studies:

(a) the whole-cell vaccine (with three strains) that has been tested in combination with the B-subunit in American volunteers should be tested alone for its immunogenicity and efficacy in these volunteers. If its efficacy is found to be poor, consideration should be given to excluding a test of the whole-cell vaccine component given alone in any subsequent field trial.

(b) the acceptability of a tablet formulation for administration of the B-subunit/whole-cell vaccine should be evaluated in a sample of infants and young children in Bangladesh and Sweden.

(c) if a tablet formulation is found to be acceptable, liquid and tablet formulations of the combined vaccine should be compared for immunogenicity in children and adults in Bangladesh and Sweden. In this study the vaccine should be administered using the same schedule and dosage as would be followed in any subsequent field trial.

(3) The Group agrees that there is sound justification for the undertaking of a field trial with the B subunit/whole-cell vaccine at ICDDR,B following completion of the above studies, and recommends that a proposal to this effect be submitted for consideration by the appropriate authorities at ICDDR,B, the Bangladesh Medical Research Council, and the Government of Bangladesh. Such a trial should include at least two groups - one receiving B-subunit/whole-cell vaccine and the other a beneficial placebo (to be determined). A third group receiving

the whole-cell vaccine should also be included unless the study in American volunteers (2a above) shows it to be ineffective. All the vaccines in the trial should be given in a total of 3 doses administered at appropriate intervals (to be decided) in the formulation (tablet or liquid) determined by acceptability and immunogenicity studies (see 2b and 2c above). The whole-cell vaccine should contain a formalin-killed classical Ogawa V. cholerae strain recently isolated in Bangladesh in place of the formalin-killed V. cholerae classical Ogawa strain (Cairo 50) (see Table 1). Each dose of vaccine should be the same in all age-groups and should contain 1 mg of B-subunit and/or 1×10^{11} killed V. cholerae organisms. The trial lots of vaccine should meet all WHO and national (French, Swedish, and Bangladeshi) requirements and should be tested for safety and immunogenicity in a sample of the field trial population before undertaking the trial.

(4) The Group recommends that, at the earliest possible date, studies be undertaken in animals to ensure that the immunogenicity of the individual whole-cell and B-subunit vaccine components remains stable when the two components are mixed and stored for a 3-month period. A range of temperatures (4-28°C) should be used in these studies.

(5) The Group considers that studies should, if possible, be undertaken in American volunteers to assess the immunogenicity (and efficacy) of the tablet formulation and dosage used (if it is used) in the field trial.

(6) The Group hopes that with this schedule a vaccine field trial can be undertaken by ICDDR,B by the autumn of 1984. It emphasizes that the mode of preparation and dosage of the vaccine component(s) recommended for this trial have been selected to maximize the likelihood of protection. If the vaccine tested should prove to be sufficiently protective, subsequent trials will be necessary to define the optimal formulation and dosage schedule at the lowest cost for its use as a public health tool.

TABLE 1

PROPOSED B-SUBUNIT/WHOLE-CELL VACCINE

B-subunit component:

Oral cholera toxin B-subunit
1 mg/ml in 1 ml of PBS buffer

Producer: Institut Mérieux, Lyon, France

Whole-cell vaccine component:

Oral inactivated whole-cell cholera vaccine
1×10^{11} cells in 8 ml of PBS buffer

Producer: The National Bacteriological Laboratory, Stockholm, Sweden

Contents:

- heat-killed V. cholerae classical Inaba (strain Cairo 48)	2.5×10^{10} organisms
- heat-killed V. cholerae classical Ogawa (strain Cairo 50)	2.5×10^{10} organisms
- formalin-killed V. cholerae El Tor Inaba (strain Phil 6973)	2.5×10^{10} organisms
- formalin-killed V. cholerae classical Ogawa (strain Cairo 50)	2.5×10^{10} organisms
- PBS	8 ml
- Thiomersal	0.1 mg

TABLE 2

IMMUNIZATION PROTOCOL FOR COMBINED CHOLERA B-SUBUNIT/WHOLE-CELL VACCINE (WCV)

Immunization group	Immunization: Initial Route*	B-sub (mg)	WCV (No of vibrios)	Second Route*	B-sub (mg)	WCV (No of vibrios)
Cholera Convalescents	Clinical cholera			PO	0.5	5×10^{10}
I	PO	2.5	5×10^{10}	PO	0.5	5×10^{10}
II	PO	0.5	5×10^{10}	PO	0.5	5×10^{10}
III	IM	0.15	6×10^{9}	IM	0.15	6×10^{9}

*PO = per os; IM = intramuscular.

TABLE 3

FREQUENCY OF ANTITOXIN (ANTI-CT) AND ANTIBACTERIAL (ANTI-LPS) RESPONSES IN INTESTINAL IgA AMONG CHOLERA CONVALESCENTS AND VACCINE RECIPIENTS

Immunization group	Responders to: Initial immunization anti-CT	anti-LPS	Second immunization anti-CT	anti-LPS
Cholera Convalescents	8/9*	8/9	7/9	8/9
I PO + PO	7/8	4/6	8/8	5/6
II PO + PO	3/8	4/8	5/7	7/7
III IM + IM	6/9	4/8	4/7	4/6

*Number of volunteers with a >2-fold rise in ELISA IgA antibody/total IgA in intestinal lavage fluid in relation to day 0/number vaccinated.

TABLE 4

CLINICAL RESPONSE OF VACCINEES (THREE ORAL DOSES OF B-SUBUNIT/WHOLE-CELL V. CHOLERAE VACCINE) AND CONTROLS TO CHALLENGE WITH 2 x 10^6 EL TOR INABA V. CHOLERAE

	N	No. with diarrhoea	Mean incubation period (h)	Diarrhoeal stool volume (in l) mean	median	range	Mean number of diarrhoeal stools
Controls	7	7*	28.8	3.5**	2.9+	0.3-7.7	13.8
Vaccinees	11	4*	48.6	0.7**	0.7+	0.4-1.0	6.8

*p = 0.01 (Fisher's Exact Test), 64% vaccine efficacy

**p = <0.05 (t test)

+NS (Mann Whitney U test)

TABLE 5

BACTERIOLOGICAL RESPONSE OF VACCINEES (THREE ORAL DOSES OF B-SUBUNIT/KILLED WHOLE-CELL *V. CHOLERAE* VACCINE) AND CONTROLS TO CHALLENGE WITH 10^6 EL TOR INABA *V. CHOLERAE*

	N	No. with *V. cholerae* in stool	No. with positive direct cultures	No. positive within 24 hours after challenge	Geometric mean* No. of *V. cholerae* per gram of stool
Controls	7	7	7	6	1.0×10^8
Vaccinees	11	10	9	6	3.2×10^6

*Mean of highest number of *V. cholerae* detected in stools of 9 vaccinees and 7 controls.

FIGURE 1

IgA ANTITOXIN ANTIBODY RESPONSES IN INTESTINAL LAVAGE FLUID AFTER IMMUNIZATION WITH COMBINED B-SUBUNIT/WCV AND AFTER CLINICAL CHOLERA

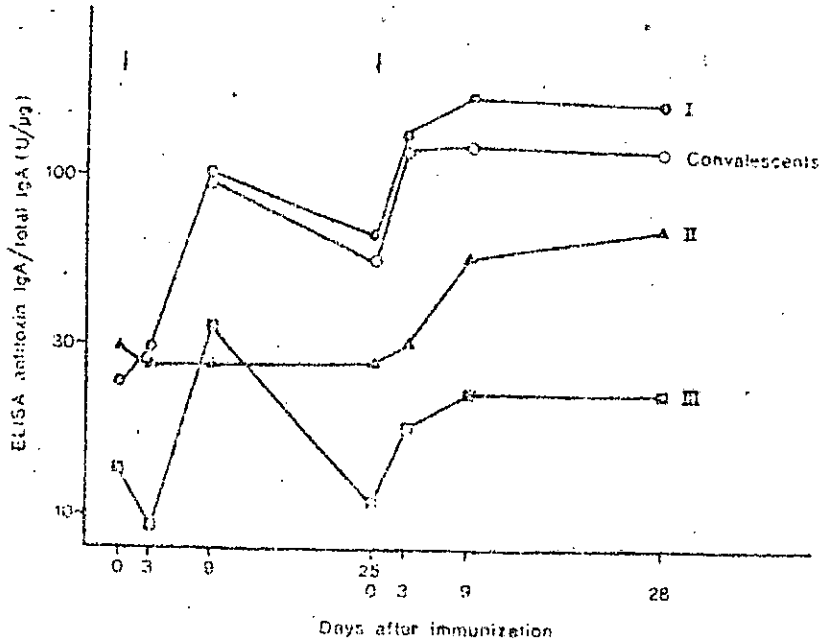
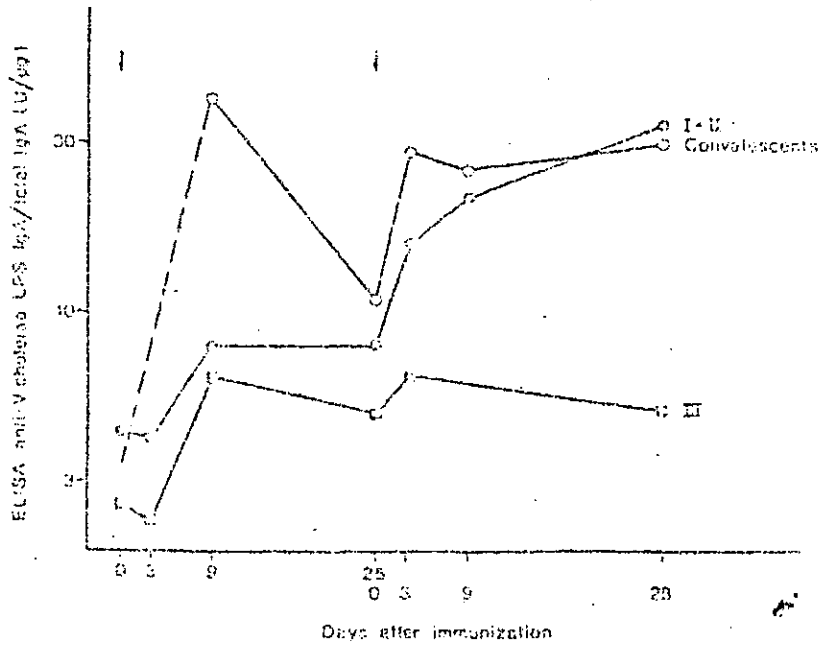


FIGURE 2

IgA ANTIBODY RESPONSE TO V. CHOLERAE LPS IN INTESTINAL LAVAGE FLUID AFTER IMMUNIZATION WITH COMBINED B-SUBUNIT/WCV AND AFTER CLINICAL CHOLERA



ANNEX

LIST OF PARTICIPANTS

Vaccine Developers:

Dr Robert E. Black, Center for Vaccine Development, University of Maryland School of Medicine, 29 South Greene Street, Baltimore, MD 21201, USA

Dr J. Holmgren, Department of Medical Microbiology, University of Göteborg, Guldhedsgatan 10, S-413 46 Göteborg, Sweden

Dr J. Kaper, Chief, Bacterial Genetics Section, Center for Vaccine Development, University of Maryland School of Medicine, 29 South Greene Street, Baltimore, MD 21201, USA

Dr M.M. Levine, Director, Center for Vaccine Development, University of Maryland School of Medicine, 29 South Greene Street, Baltimore, MD 21201, USA

Dr J. Armand, Directeur des Recherches et Applications, Institut Mérieux, 17, rue Bourgelat, Lyon Cedex 1, France

Professor H. Lundbeck, National Bacteriological Laboratory, 10521 Stockholm Sweden

ICDDR,B Board of Trustees:

Professor D. Bradley (also a member of CDD Technical Advisory Group), Director, Ross Institute of Tropical Hygiene, London School of Hygiene and Tropical Medicine, Keppel Street (Gower Street), London WC1E 7HT, England

Professor J. Kostrzewski (also a member of CDD Technical Advisory Group), Chief, Department of Epidemiology, State Institute of Hygiene, Ulitsa Chocimska 24, Warsaw 00-791, Poland

Major General M. Shamsul Huq*, Minister of Health, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh

ICDDR,B:

Dr W.B. Greenough, Director, International Centre for Diarrhoeal Diseases Research, Bangladesh, G.P.O. Box 128, Dhaka 2, Bangladesh

Steering Committee of the WHO/CDD Scientific Working Group on Bacterial Enteric Infections:

Dr N.F. Pierce (Chairman), Department of Medicine, Baltimore City Hospitals, 4940 Eastern Avenue, Baltimore, MD 21224, USA

Professor Y. Takeda (also a member of ICDDR,B Board of Trustees), Research Institute for Microbial Diseases, Osaka University, Yamada-Kami, Suita, Osaka, Japan

Bangladesh Medical Research Council:

Dr Farida Huq*, Head, Microbiology, Institute of Public Health, Mohakhali, Dhaka, Bangladesh

Outside Experts:

Professor J.P. Craig, Department of Microbiology and Immunology, Downstate Medical Center, State University of New York, 450 Clarkson Avenue, Brooklyn, NY 11203, USA

Dr S.C. Pal*, Director, National Institute of Cholera and Enteric Diseases, 3, Dr M. Ishaque Road (Kyd Street), Calcutta 700016, India

Observers (for ICDDR,B):

Dr Roger Glass
Dr J. Clements
Dr B. Clements

WHO Secretariat:

Dr M.H. Merson, Programme Manager, Diarrhoeal Diseases Control Programme, WHO, Geneva, Switzerland

Dr D. Barua, Consultant, Diarrhoeal Diseases Control Programme, WHO, Geneva, Switzerland

Dr A. Kafilludin, Medical Officer, Diarrhoeal Diseases, WHO Regional Office for South-East Asia, New Delhi, India

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*Invited but unable to attend

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11/BT/June 83

REPORT OF THE PERSONNEL & SELECTION COMMITTEE

REPORT OF THE PERSONNEL AND SELECTION COMMITTEE

The Personnel and Selection Committee of the Board has met on two occasions since the full Board Meeting in December 1982. A meeting on 19 March, 1983 was held in Geneva at WHO and a meeting before the Board Meeting was held on 12 June 1983 at IIE in New York.

In the first meeting an organizational diagram was discussed and it was decided that this matter should be left with the management of the Centre with regard to functions and assignment of responsibilities. The number of positions and a manpower plan was requested for the next meeting of the Committee. Staff rules on recruitment, selection, appointment and promotion procedures and geographical quotas were reviewed and compared consonant with WHO for P1-3 level positions. Recommendations for new Board members were agreed upon and an overall review of recruitment and appointments was done. The minutes of the 19 March meeting were approved after incorporation of amendments.

In the meeting on 12 June 1983 a report on compliance to WHO staff rules and scales was made. Complete compliance has been achieved except with respect to some project staff. Since their pay scales were fixed in negotiation with donors no budgetary allowance was present to adjust their scales. It was estimated that if conversion were done cost overruns on projects of about $70,000 U.S.

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would occur. The following decisions are recommended:-

1. That all future projects should be budgetted according to WHO scales with contingency for increases.

2. As soon as financially feasible all project staff should go to WHO scales.

3. Staff now designated community workers are neither project nor core staff of the Centre but are related to community or government scales and should remain so linked. WHO does not have such workers or scales for them to the best of the Centre's knowledge.

The Extended Scales were reviewed and recommended for final approval by the Board.

A working paper on the pension fund was discussed. It was noted that the Centre was rejected by the UN pension scheme since it is not a UN agency. It is therefore suggested that maintaining a Provident Fund and Severance Pay, preferably held in U.S. dollars in a nationalized Bangladeshi bank, would be the best interim solution to the need for a pension scheme.

It was agreed that in order to insure a proper geographical balance of core staff thus demonstrating in fact the international character of the Centre that a geographical quota should be established. The WHO has a quote system based on considerations not applicable to the Centre. Since the composition of the Board was carefully worked out it was believed that this should serve as a guideline for geographical distribution of staff.

There was an in depth discussion of staff promotion and surrounding issues especially with respect to the extended scales. It was agreed that WHO policy should be followed. A report was submitted

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to the Committee and the following procedure agreed upon to be recommended to the Board.

'Any staff member whose post is reclassified to a new grade will compete with other applicants for the reclassified post. If the staff member is successful he will be promoted to the new level into which the post has been classified. If unsuccessful and another applicant is appointed to the reclassified post the unsuccessful staff member may as an alternative to termination of his services request the Director to be reassigned.'.

Under this rule any reclassified post would be advertised and if at the international level international advertisement would be mandatory. This avoids the problem of 'creeping' promotion and entry of persons into positions which require function beyond their abilities. The promotion procedures are recommended as presented.

The matter of the process for post classification was taken up, found consistent with WHO, and is recommended for adoption with some amendments which have been incorporated. It was noted that the Management Committee serves in an advisory capacity to the Director who may form and dissolve all except Ordinance or Trustee mandated committees in the operation of the Centre. No committee supercedes in decision-making power that of the full Board.

The WHO procedures for personnel recruitment and selection as adopted to the Centre were reviewed amended and suggested for approval by the Board. Several policy matters are contained in these procedures:

- The Board would not usually continuously employ staff in P (international) level posts for more than 6-8 years.
- Contracts may ordinarily be for periods of two or three years.

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- All P level positions are considered as 'international level' and as required by the Ordinance of the Centre will be appointed by the Board.

The selection of new staff to vacant posts has not reached the point at which a list of agreed on candidates can be presented to the Board at this June meeting. In order not to delay recruiting vital new staff when the Personnel and Selection Committee has reviewed the many applicants and agreed the concurrence of the Board by mail or telex may be requested. Response to the advertisements has been very good. The closure date for receipt of applications was May 30th due to the slowness of mailings to Dhaka. The closure date in advertisements was 30 April, 1983. The full lists and all applications are in New York available for Trustee review.

A manpower plan was presented and recommended for adoption. In view of financial constraints the Director was asked to make a priority listing for recruitment to vacant posts. This does not include posts already reclassified:

3 scientific positions including one for Library Sciences;

3 administrative positions including those of the Computer Manager, Finance Controller and Supply Officer.

This follows:

PRIORITY LISTING OF POSITIONS TO BE RECRUITED (VACANT AND NEW)

		Millions	
		Cost	Cumulative UN Budget floor of 6.3 million
1.	Senior Scientist Disease Transmission (Programme Head)	.083	6.383
2.	Senior Scientist Community Services Research (Programme Head)	.083	6.466
3.	Microbiologist	.083	6.549
4.	Epidemiologist Disease Transmission	.066	6.615
5.	Pediatrician MCH-FP CSR	.049	6.664
6.	Personnel Officer	.058	6.722
7.	Admin. Services Officer	.066	6.788
8.	Programme Coordinator	.076	6.864
9.	Operations Research CSR	.065	6.929
10	Communications Specialist	.053	6.982
11	Nurse Trainer	.035	7.017
12	Pediatrician Pathogenesis & Therapy	.054	7.071
13	Nutritionist	.048	7.119
14	Health Economist	.048	7.167
15	Computer Analyst	.065	7.232
16	Training Materials Development	.053	7.285
17	Trainee Physician	.048	7.333
18	Extension Coordinator	.038	7.371
19	Immunologist	.065	7.436
20	Clinical Researcher	.065	7.501
21	Head Hospital	.065	7.592

In preparing the above priority listing the following considerations were weighed in order of importance:-

1. Need for Centre.
2. Identification of strong candidates (stage of recruitment).

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A proposed list of reviewers to carry out the Ordinance mandated external review early in 1984 is presented to the Board. It is felt that in each category a minimum of three alternatives be designated who could be contested to insure committing a full term at an early date. The lists follow this report.

The following list of new Trustees is suggested for appointment to the vacancies of those completing their terms. The balance of geography, discipline and developed-developing country categories have been considered and are maintained in these selections.

To be reappointed

Dr J. Sulianti Saroso - Research/Administration - Indonesia

New Appointments

Dr Immita Cornaz	-	Social Sciences	-	Switzerland
Dr Abdul Al-Swailem	-	Pediatrician	-	Kingdom of Saudi Arabia
Dr Derrick Rowley	-	Immunologist	-	Australia

The Government of Bangladesh has sent the following letter nominating a new individual to the seat now held by Mr M.K. Anwar.

'I am directed to say that the Government of the People's Republic of Bangladesh in the Ministry of Health and Population Control has been pleased to nominate Mr A.B.M. Ghulam Mostafa, Secretary, Ministry of Health and Population Control as one of the Directors of the Board in place of Mr M.K. Anwar, the ex-Secretary of this Ministry whose term will expire on 30.6.83.

2. This issues with the approval of the Minister for Health and Population Control.'.

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The recommendations from the Director in connection with Mr Mark Tucker's retirement are suggested for adoption and implementation.

A request from the Director to extend the contracts of Drs Samadi and D'Souza beyond the period decided in the December 1982 Board Meeting was considered and is not recommended. Any need for out placement may be dealt with for short term action by the Director. Dr Sanyal is on leave from his University which has agreed to allow him to complete his research in Dhaka. He is considered as a Visiting Scientist deputed from a University and extension of his stay is recommended up to 31 January, 1984.

It was agreed that the positions now designated 'Programme Head' would be redesignated as Associate Director in charge of Programmes.

A rewording of Resolution 23/Dec. 82 is recommended as follows:

'Resolutions 17 through 22/Dec. 82 indicate the completion of transition of the Centre from the former Cholera Research Laboratory to the current International Centre for Diarrhoeal Disease Research, Bangladesh. The provisions of Clause 30(b) of the Ordinance will cease to apply with this transition. The Board asks the Director to ensure that all staff conform to WHO staff rules and pay scales by 1 January, 1983 with a report to the Board.'.

The requirement for a position of Deputy Director was discussed and the establishment of such a position is not recommended.

Contracts for the reappointments of staff to international level positions were reviewed. It was noted that two contracts provided new benefits not given on previous contracts. Since it had been stated in the minutes of this Committee when it met in December 1982 that 'there will be no special increase in steps or level except by

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action by the Board for all ranked at these levels'. It was felt that the matter of the added benefits were beyond the authority of the Director in these cases.".

LIST OF CANDIDATES EXTERNAL REVIEW 1984

MICROBIOLOGY-IMMUNOLOGY

Person	Country
C. Gadjusek	United States
B. Rowe	United Kingdom
J. Craig	United States
P. Orskov	Denmark
H. Mäkälä	Finland
S. Holm	Sweden
H. Smith	United Kingdom
O. Ouchterlony	Sweden
M. Harboe	Norway
G.N. Cooper	Australia
Y. Watanabe	Japan
Y. Takeda	Japan
J. Robbins	United States
M. Richmond	United Kingdom
A. Allison	United Kingdom
D. Westphal	Germany
S. Formal	United States

CLINICAL SCIENCES

Person	Country
Klaus Gyr	Switzerland
Dilip Mahalanabis	India
D. Habte	Ethiopia
A.S. McNeish	United Kingdom
A.H.G. Love	Ireland
Henry Binder	United States
Anne Ferguson	United Kingdom
J. Keusch	United States
Tytgat	Netherlands
I.H. Rosenberg	United States
R. Hornick	United States
H.I. DuPont	United States
D. Powell	United States
R. Zetterström	Sweden
O.R. Kuti	Nigeria
J. Rohde	United States

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IMMUNOLOGY

Person	Country
Pearay Ogra	Sweden
John Robbins	United States
N.F. Pierce	United States
Lars A. Hanson	Sweden

EPIDEMIOLOGY

Person	Country
A. Feinstein	United States
R. Oseasohn	United States
B. Rowe	United Kingdom
G. Gibson (Health Services)	United Kingdom
B. Cjetanovic	Yugoslavia
E. Gangarosa	United States
A.S. Muller	Netherlands
A. Monto	United States
J.M. Boggono	Chile
E. Bermawy	Egypt
R. Brupbacher	Switzerland
Daid Mel	Yugoslavia

BEHAVIOURAL SCIENCES
Health Care and Development

Person	Country
L. Ruzicka	Australia
J. Pierre Habicht (Econ. Nut)	Switzerland
D. Banerjee	India
G. Widstrand	Sweden
Meli Tan	Indonesia
W. Brass	United Kingdom
J. Caldwell	Australia
M. Sringalingbum	Indonesia
R. Nicholas	United States
D.P. Mukherjee	India
K.E. Knutsson (Soc. Anthro)	Sweden
J. Sirajaldin	Egypt
A. Rosenfield	United States

NUTRITION

Person	Country
Vinodini Reddy	India
F. Viteri	Guatemala
J. Cravioto	Mexico
N.S. Scrimshaw	United Kingdom
Kayardi	Indonesia

NUTRITION (cont'd)

Person	Country
R. Whitehead	United Kingdom
A. Ashworth	United Kingdom
C. Gopalan	India
Lindquist	Sweden
D.B. Jelliffe	United States
Bhumiratna	Thailand
J.C. Waterlow	United Kingdom
A. Lechtig	Peru

SUGGESTIONS FOR EXTERNAL REVIEWERS FOR 1984

Programme Area	Person	Country
Administration/Finance	Dr Omond M. Solandt	Canada
	Mr M.K. Anwar	Bangladesh
Training	Dr William Cutting	U.K.
	Paul Touchetta	U.S.A.
	Ronald Hardin	U.K.
	A. Lechtig	Peru
Pathogenesis & Therapy	G. Keutsch	U.S.A.
	Demise Habte	Ethiopia
	R. Zetterstrom	Sweden
	Klaus Gyr	Switzerland
Disease Transmission	Dr M.H. Wahdan	Egypt
	Dr Kenya	Kenya
	E. Gangarosa	U.S.A.
	Dr Bencic	Yugoslavia
	Dr R. Feldman	U.S.A.
Host Defence	Dr Pornchai Matangkasombut	Thailand
	Dr N.F. Pierce	U.S.A.
Nutrition	Dr Srikantia	India
	Jane Kusin	U.K.
	L. Chen	U.S.A.
	A. Pradilla	Colombia
	Allay Hammad	Egypt - WHO
	John Waterlow	U.K.
Community Services Research	Dr Gerhard Pfister	Switzerland

Programme Area	Person	Country
CSR Demography	Dr J.C. Caldwell	Australia
	Dr Apichat Chamratrithirong	Thailand
	Dr Badrud Duza	Bangladesh
	Dr R. Esquire	
	Dr L. Ruzicka	Australia
Microbiology	Richard Wyatt	United States
	Ms E. Yabuuchi	Japan - Gihu
	Prof. Nzatse	Kenya
Computer Sciences	Peter Smith	United Kingdom
	Walter Willett	United States
	Richard A. Kromwell	United States