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PROCEEDINGS OF THE CONSULTATIVE GROUP MEETING OF THE

PROCEEDINGS OF THE CONSULTATIVE GROUP MEETING OF THE INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

Geneva, 6 June 1980

INTERNATIONAL CENTRE FOR
DIARRHOEAL DISEASE RESEARCH, BANGLADESH
G.P.O. Box 128, Dacca - 2
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PREFACE

The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) was established under an Ordinance promulgated on 6 December 1978, by the President of the People's Republic of Bangladesh. The ICDDR,B is governed by a Board of sixteen trustees, each acting in his or her own capacity. The majority are drawn from developing countries. The Government of Bangladesh may elect three members, and WHO one. The first meeting of the Board was held at the Centre from 25-30 June, 1979.

The first meeting of the Consultative Group was sponsored by UNDP, hosted by WHO and convened on June 6, 1980 in Geneva, Switzerland. The purpose of the meeting was to bring together representatives of interested countries and agencies from around the world to consider the programme and progress of the Centre during its first year of life.

The proceedings of the Consultative Group meeting have been edited from transcripts of taped recordings to present an overall picture of the meeting.

ICDDR,B takes full responsibility for this report.

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MEETING OF THE CONSULTATIVE GROUP ON THE INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

Geneva, 6 June 1980

ADOPTED AGENDA

1. Introductory Remarks

2. Adoption of the Agenda

3. The International Centre for Diarrhoeal Disease Research, Bangladesh

   (a) Programme and Progress Report

   (b) Budget 1981 - 1985

   (c) Construction of New Facilities

4. The WHO Global Programme on Diarrhoeal Diseases

5. Statement of Host Country

6. Indication by Members of the Consultative Group of Participation with ICDDR,B

7. Responses

8. Other Business

INTRODUCTORY REMARKS

Mr. W. T. Mashler, Chairman

On opening this meeting I think we can be proud to have the heads of two important agencies, one a health (substantive) agency and another a major funding agency, present with us. Their presence re-emphasises the importance that is lent by these two organisations to the sector of public health and particularly to diarrhoeal disease research which is at the very root of the development process.

The internationalisation of this Centre was not an easy task. It took quite some time. It is now a reality and we hope that within the next year or so it will form part of a major international effort to combat diarrhoeal diseases through research as well as through the application of known methods in a much more effective way than it has been done heretofore. This is an effort which is in line with the initiative which was taken some five years ago in coming to grips with the tropical diseases. Hopefully, as we move on from one disease sector to another, we will eventually encompass all the major issues which need to be addressed and redressed. It is, therefore, one of the encouraging experiences possible in the international system to see that something visible can be achieved. This is not often the case. Too often we deal with hundreds and thousands of projects, the results of which are not visible. But in a research effort where you are focus-oriented, there is a prospect of something coming out at the other end which will be a lasting contribution that international communities can make to humanity over the years and generations to come.

Dr. H. Mahler, WHO

I am certainly very pleased to offer remarks together with my friend and colleague, Mr. Bradford Morse, on something which I consider very important. I don't think that one Centre makes a global diarrhoeal disease control programme. But I think when it is set in the perspective of the potentials of really doing something about diarrhoeal diseases in the coming years, then this Centre becomes very important. When I first looked at this Centre, my initial impression was that this was a typically supranational Centre. My Bangladeshi friends will know how concerned I was that a country such as Bangladesh with its disease problems, in which the Government must be involved in promoting health, had a Centre in its midst with a high international reputation; but there seemed to be no aggressive identification by the Government with the Centre to make it part and parcel of its national health destiny. As we know, diarrhoeal diseases not only have to do with national health but are at the very root of the development potential of people in many developing countries. Therefore, an effective, efficient approach to diarrhoeal disease is important. I was very concerned about the role of this Centre. I wanted to be sure that we were establishing something that not only served a global perspective but was closely linked to serving the needs of the host country. In my humble opinion, I would say that we have created genuine bridges not only South/South but also very much North/South, in the field of health.

The Diarrhoeal Disease Programme, I think, is going to be a very potent, useful example of Technical Cooperation to Developing Countries (TCDC). It is also going to be a powerful example of the contribution of North-South cooperation in order to make real progress in this field over the next few years. All of us realize that this is not a platitude. We know that with the necessary political will and managerial competence, we can dramatically reduce mortality; and, what is much more important, cause dramatic improvements in the nutritional status of children. That, to me, is infinitely more important because those children are the survivors. It is important that they grow up healthy in order to absorb some capacity to acquire the necessary skills for development of their own countries.

We now have a Centre reasonably nationalized, yet keeping all the advantages of its international scope. We have not only that, but we also have a WHO Collaborating Centre within the UNDP/World Bank/WHO efforts. This will stimulate efforts to get a vigorous and effective global diarrhoeal disease control programme. This promotes TCDC in the best sense of the term. This Centre will certainly serve not only Bangladesh; I am sure that the generosity of the Bangladesh Government will also very much welcome its becoming part of a TCDC network, which is clearly built into the Global Programme. This will create the necessary North/South links so that we will get the best of both worlds.

I am very happy that WHO can provide the physical environment for this meeting. If we can also provide a little bit of spiritual and intellectual environment which encourages us to take some steps forward, I certainly will be very happy. My own emotions are all with the Diarrhoeal Disease Programme. I consider it a vital link with all the best components of primary health care.

I hope we will make this Centre a genuine first-rate Centre. All of us who are privileged to be involved, those developing countries who have the courage to move strongly forward, and the international agencies who have the courage to become involved, will look with pride at the Centre, I am sure, in a couple of years from now.

Mr. B. Morse, UNDP

It's really a privilege for me to join you here on this first morning of the Consultative Group of the International Centre for Diarrhoeal Disease Research. It may surprise some of you, but earlier in my life I had managerial responsibilities for a modest medical research programme; as a matter of fact, among its accomplishments was the development of the chemotherapy which has controlled, if not eradicated, tuberculosis. So I am proud to be here with you.

We will certainly continue to financially support this International Centre, to which the United Nations Development Programme has contributed modestly on the conceptual and institutional foundations, as an important part of our commitment to the international community to improve the health and the well-being of hundreds of millions of people who, like us, have invested their futures in this small planet.

We are keenly aware that diseases can be tropical, diarrhoeal and in many other categories. A massive and sustained development effort by the international community to control them must be mounted in the next decade and beyond, to help build up a strong, vigorous, healthy human infrastructure, which will allow developing countries to attain their goals. This will be absolutely necessary if there is going to be any meaningful progress in the adjustment of the existing world economic and social relationships to a more just and equitable balance.

We in the Development Programme recognise that there are probably three basic elements that are fundamental to human progress: nutritious food, pure water and good health. Our support of the Diarrhoeal Centre is just one evidence of our commitment to improvements in those particular areas.

Dr. Mahler talked about technical cooperation among developing countries. There are so many things which disappoint those of us who are engaged in the business of seeking to improve human conditions through development to enrich human lives, in the current malaise in world economies affecting international development efforts. On TCDC, one is the reluctance of developing countries themselves to take the sovereign initiatives that are necessary to share with others. I will share with you one encouraging development, which we in the United Nations Development Programme are working on very vigorously. I think it has some relevance to your work here. We have undertaken to support a

major development informational network. We hope within four years to have this operating in fifty or sixty developing countries, using a very modest existing technology, with regional centres in seven parts of the world. In these, all manner of development information can be shared, including information relating to health and health-related activities.

I am very pleased to have this opportunity to be with you this morning. There is no doubt in my mind that the work that you are doing here will have significant effects on the lives of hundreds of millions of people who have never heard of WHO, the United Nations Development Programme or of the United Nations. I particularly want to thank the distinguished scientists who have lent themselves to this undertaking, the Government of Bangladesh for their initiative, my colleagues Bill Mashler and Bernard Zagorin for the part they played in it, Dr. Mahler and his colleagues for the very excellent work that they have done in seeing to it that this Centre can be truly a coordinating point of the global health research programme, when it becomes the effective reality I know it will be in the future.

Mr. B. Zagorin, UNDP

What is now the ICDDR,B may have started quite a long time ago in the minds of people; but in December 1977, as I recall, Mr. Muhith, Secretary of the External Resources Division in Bangladesh, called a meeting in Dacca to talk about the internationalisation of what was then the Cholera Research Laboratory which had been going for about 17 or 18 years. Thereafter, over the course of 1978, words were put together forming a charter for the organisation. It was discussed at great length with participation of a number of UN agencies, donors, and countries contributing at that time -- Ford Foundation, IDRC Canada and others. By December 1978 it had taken the rather unusual form of an international organisation established through a national ordinance. A national ordinance of Bangladesh claimed the establishment of the new centre as under the laws/ordinances of Bangladesh. In February 1979, with that having formed the base for the organisation, there was a meeting in Geneva and the internationalisation and the selection of the Board of Trustees took place.

The first meeting of the Board of Trustees was in June of 1979 in Dacca and the Centre began as an international institution on 1 July 1979. That's all very interesting history, but I would like to stress one thing which is perhaps much more important. From the point of view of the Charter and what it was trying to do, what has happened in the course of the last eleven months, the first eleven months of its existence, seem to me a very important thing to stress now, because the Centre has accomplished so much in working for the developing countries.

I was looking at the Charter with whose now familiar words "special reference to the developing countries, we struggled." Prevention and control of diarrhoeal diseases and improvement in public health programmes has

a special relevance to developing countries. How does one keep that international relevance with an organization that was essentially bilaterally programmed for so many years and was already established within a country? How was it done? I would like to say how pleased I am that its first eleven months of existence have shown that the Centre is in fact doing it. To show how it is really serving its mandate: about a month ago, representatives from different regional offices of the WHO - Manila, Alexandria and New Delhi - met in Dacca with people from various institutions from developing countries of the region. They began to develop a training programme for field activities which would be assisted by this Centre. Thus, the work done at the Centre would, in fact, be disseminated through the field work of these other bodies. At the core of this has to be, of course, the WHO. It has the field network, and is creating the general diarrhoeal programme and exploring what can be done from this network. This has all been extremely interesting to me. As a layman I did not know much of the technical aspect; but the very process, occurring only ten months after the Centre began, seemed to me very significant.

This also happens to be of interest to me because this is supported not only by the global programme but also is a UNDP Regional (Asia and the Pacific) Programme, executed by WHO. I think in so many ways what had been perhaps a high-sounding purpose has been accomplished even in the first ten or eleven months. The very fact that there are so many representatives here from the developing countries is indicative of a keen interest. So many people from the developing countries seem to be coming to take an interest in the Centre. I think that what may have sounded like a hope, at least for those who put together a Charter, is turning into a reality; not after many years, but after just a few months. I would like to close by saying again that the history was quite interesting, but it's an old story. What really is important is what is happening now and I think it is quite successful from our point of view.

AGENDA AS ADOPTED

Chairman

This, ladies and gentlemen, concludes the introductory remarks. I now invite you to look at the agenda. Unless I hear any remarks, I assume the agenda is adopted as is ordered. You will see from the agenda that we have placed together three major items, viz. A. the Programme and Progress Report, B. the budget for the quinquennium 1981-1985 and C. the construction of new facilities. These issues are essentially inter-related and we felt that they could be put under one item so that, once the introductions have been made to the various papers and issues, they could then be discussed. Our purpose is, therefore, to go through the various introductions which will summarise for you and bring up to date the papers that are before you; we can then answer questions and hear statements from the floor. Therefore, first of all I call on Dr. Sulianti, the Chairman of the Board of Trustees of the International Centre, to make some introductory remarks on behalf of the Board of Trustees.

THE INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH

Dr. J. Sulianti Saroso, Chairman, Board of Trustees, ICDDR,B

First of all I would like, on behalf of the Board of Trustees of the International Centre for Diarrhoeal Disease Research, Bangladesh and on behalf of the Centre, to thank the UNDP and WHO for organising this consultative group meeting. I would also like to thank Dr. Mahler and Mr. Morse for being present at the opening of the meeting because we all know how busy they are. Their remarks signify the importance of the work to be undertaken by the Centre and I hope that we will not disappoint expectations. Mr. Zagorin already explained how the idea of internationalisation of the Cholera Research Laboratory was conceived and how the Centre was born. An initial Board of Trustees was selected to nurse the newborn baby. On the occasion of the first meeting of the Board, in June of last year, the President of Bangladesh, H.E. Ziaur Rahman himself, formerly inaugurated the Centre. The aims and objectives of the Centre, as stated in the Ordinance which Mr. Zagorin already mentioned, are the following: "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.... to provide facilities for training to Bangladeshi and other nationals in areas of the Centre's competence, in collaboration with national and international institutions." To achieve these objectives the Centre will undertake the following activities:

1. Conducting clinical laboratory and field research with the objective of developing practical technology for disease prevention and health care along with methods for the application of these technologies.

2. Conducting research and applied training programmes for scientists, administrators, technicians and other persons.

3. Developing collaborative research and training efforts with national and international institutions, particularly in the developing countries, to strengthen local initiative and capabilities.

4. Sponsoring technical educational seminars.

5. Publishing information on new technology. In the document that has been given to you, you will find a list of publications available at the Centre, which can be requested.

6. Consulting with Government and other agencies on effective application of health interventions. Dr. Greenough, the present Director of the Centre, will elaborate on all these activities.

As I said before, the Board of Trustees has been entrusted to nurse the new born baby; it is not an easy task. That is why we welcome very much this Consultative Group Meeting and hope that this will result in the active participation of the countries and organisations you are representing, spiritually as well as financially, of course.

In Appendix A, the Progress Report which is in the booklet, are the names of the members of the Board of Trustees. You may notice that they are individuals with wide reputations in their varying fields of medical research, health care and public administration. I am very happy to report to you that the Board in its first year of existence has held already two plenary meetings, with all members attending except for one. I think that's an achievement if you see how busy all these people are in their respective countries. It has not been easy to convene the entire Board at one time. For the coming meeting we have been sending many cables back and forth to make final plans for the meeting. Most members will be present in the first week of December.

The immediate objective of the Board has been to endow the Centre with facilities and personnel structure consistent with its mandate and status as an international organisation. Another has been to encourage constructive relationships with other scientific institutions inside and outside Bangladesh. I think this was what Dr. Mahler was referring to: it is not supranational but international, but in very close cooperation with the research institutions present in Bangladesh.

I would like to emphasize that to broaden the programme of the Centre, we are now giving high priority to community services research and to training. At the first meeting the Board made a very strong point that research should not

stop in the laboratory or in hospitals, with only clinical research to know in the laboratory what an agent is, but that all the results should be tested in the field and that we should obtain practical methods to overcome the problems.

In the beginning, of course, the Board put first attention to the management in order that the Centre could function. In that connection Dr. Greenough was appointed to become the Director for its initial phase; he was already there as Scientific Director of the Cholera Research Laboratory. A Search Committee has been set up to search for a Director when Dr. Greenough is no longer available. I can report to you that a list of candidates of qualified persons has been made, but the final selection has not been done yet.

The Board has also approved an organisational structure for the Centre overall and has approved a task-oriented, rather than a discipline-oriented, organisation of the scientific research staff. That is something which I think is an innovation. It has made adjustments in the compensation plan of the Centre staff in regard to their salaries, to be comparable with other international organisations in Bangladesh, although not equal. Because of the rising cost of living in Bangladesh as elsewhere in the world, such adjustments have been, in fact, long overdue.

We also initiated procedures for the selection of an Auditor and for the formulation and approval of financial systems appropriate to the multiple and international sources of the Centre's fundings. Those of the international organisations know that there are so many regulations which we have to comply with; therefore it is very necessary to do it with a sound financial system.

With regard to the Scientific Programme, members of the Board came to Bangladesh prior to the formal Board Meeting in February of this year and made site visits to observe the research undertaken and to have discussions with the scientists on the spot. Besides that, the Board also had scientific sessions with all the Working Groups of the Centre, presenting their studies and having frank discussions on their programmes.

The Board feels that in this way it is executing its powers and functions as stipulated in the Ordinance.

Another item to report to you is the allocation of 4.0 acres of land by the Government of Bangladesh to the Centre for the construction of needed facilities. I would like to take this opportunity to thank the Government of Bangladesh for their generous donation; I hope that our gratitude will be conveyed by the Bangladesh Representative, Mr. Muhith.

In conclusion I would like to make an appeal to all representatives here. We all know that diarrhoeal diseases are a leading cause of sickness, malnutrition and death - I don't have to elaborate on that because the previous speakers have already mentioned it. I am convinced that the International Centre for Diarrhoeal Disease Research, Bangladesh, will be able to make an

important contribution in finding solutions to overcoming diarrhoeal diseases. I do not believe that we can work without a sound technology that is appropriate to be used in countries like my own and like Bangladesh. Where health staff is scarce we have to utilize families, mothers etc.; this can be done in diarrhoeal diseases. You will hear more about this from Dr. Greenough. My appeal now is that if every country, including the least developed countries would participate actively in this new Centre and would make modest financial contributions, it will really become an international Centre serving all the countries, especially the least developed countries. The Centre can then play a role in the global diarrhoeal diseases programme such as the one Dr. Mahler described.

Dr. W. B. Greenough III, Director, ICDDR,B

I don't need to elaborate on the importance of diarrhoeal diseases. I would like to underline one thing, however, and that is that these diseases have a particular social, environmental and biological context in which they exist. Even in the host country of Bangladesh there are wide differences depending on the geographic areas, so between countries there may be even wider differences. It is necessary to learn about these diseases in their particular context, which means it is essential that they be studied within particular countries; thus, this cannot be a supranational activity.

There is a very delicate balance between the discovery of technologies, their development and their application. It is costly and of little help to apply ineffective methods in the field. It is equally fruitless to persevere and elaborate on refinements of ineffective technologies at a basic level. What is needed is a creative process of discovery, coupled with a strong and directed effort to place the fruits of discovery where they will be the most helpful to people, with an adequate interaction to maintain focus. The Centre tries to do this, and after all other words are spoken, I think that putting a high quality institution in a place where the most important health problems in the world exist is crucial to producing creative and effective solutions to these problems.

As Dr. Sulianti has mentioned, the Centre has been undergoing an organizational change since its birth. I hope that after a year it is an actively kicking infant. There are five programmes, each of which is addressed to a particular problem area of diarrhoeal diseases as a part of the health matrix.

The first of these programmes, which are implemented by working groups, is community services research. It endeavours to take the fruits of research into the field, apply them and make them ready for application in training and extension activities.

The next is the nutrition programme, which studies the cycle of diarrhoea and malnutrition that exists in the context of developing countries, and particularly least developed countries.

The third is the host defense programme, which looks at the defense of the individual - the host. What are the general and specific defenses and how can they be bolstered to defend against the microbes which cause diarrhoea?

The next is the disease transmission programme, which examines the transmission of diarrhoea and how it is spread.

The fifth is the pathogenesis and therapy programme which studies the pathogenesis of and therapy for each agent causing diarrhoea, to determine which methods can be adapted to prevent or modify the course of illness by the causative agent.

Additionally, a training and extension programme takes the fruits of these efforts at various levels and brings them to people in both Bangladesh, regional countries and the world. These activities are supported by the bio-chemistry, immunology and microbiology laboratories and an animal resources branch. Other support facilities provide the logistics for field activities.

I would emphasize that the majority of our effort is in the field, both in rural and urban areas.

We work in three areas in Bangladesh. The first is Dacca city, where the Centre is located. The second is Matlab in Comilla District, about forty miles south of Dacca. The third is Teknaf, located on the southernmost tip of Bangladesh, on the Bay of Bengal on the border between Burma and Bangladesh.

Bangladesh is a country that has seasonal variations, characterized chiefly by water rich (monsoon) and water poor periods. Melting snow in the Himalayas produces the largest flow of fresh water on the surface of this planet; this vast resource traverses Bangladesh. During the monsoon, water levels rise to 12 to 20 feet above winter levels.

The Community Services Research Working Group collects extensive demographic data from a population of 160,000 in Matlab, and 40,000 in Teknaf. The causes of death and disability are being examined, as are fertility and population dynamics, to determine the demand for and effectiveness of fertility control services.

This Group is evaluating several approaches to oral rehydration therapy in diarrhoeal disease. Initial data from the oral therapy field trial in Matlab show that the two areas receiving a standard WHO oral rehydration solution (ORS) or a simple salt-sugar solution, have a much lower hospitalization rate than those areas which are not receiving ORS. The outcome variables between the simple salt-sugar solution and the WHO-recommended complete mixture have not yet been evaluated. This will be completed in the coming year.

In the Teknaf area, one community receiving the WHO ORS packet for the treatment of diarrhoea was compared to a community close to the treatment centre. In the community receiving the packet, the mortality rate due to diarrhoea was lowered significantly when compared to the community closer to

the treatment centre. The other important finding in Teknaf is that a treatment centre only affects the mortality within a three-mile radius. Perhaps this result will exert influence with respect to health policy in Bangladesh and other countries.

During 1978-79 we changed our Family Planning Project from one in which contraceptive measures were simply distributed, to one which integrated health care elements into the contraceptive programme. In addition to fertility control we now provide nutrition advice to pregnant mothers, tetanus immunization to pregnant mothers and oral rehydration therapy for diarrhoeal disease to all. Put together, these few things have resulted in one-third of the fertile population using some contraceptive method.

We have been studying cholera and diarrhoea for 18 years in this area and now have precise ideas about this as a cause of death. However, we have not been able to attribute a cause to all deaths. Now our major effort will be to ascertain the cause of death by village reporting.

The Nutrition Working Group is addressing itself to the following topics:

the decreased food intake due to anorexia
or
withholding of food as a measure to control diarrhoea;
the loss of nutrients in the feces and increased catabolism due to infection.

We recognize that nutrition and diarrhoea are very much interlocked. Certainly, diarrhoea can cause decreased food intake due either to cultural practices or to anorexia. We know from the research done in the past year that some diarrhoea results in loss of valuable blood proteins from the gut and failure of the gut to absorb nutrients. In addition, there is increased breakdown of body components during such illness. The Nutrition Working Group is measuring the impact of diarrhoea on the nutritional state.

One of the most interesting things underlining the importance of breastfeeding is that breast milk intake is very little reduced by diarrhoeal diseases, while other foods are not well tolerated or desired. Thus, mother's milk is pivotal in sustaining nutrition through an episode of diarrhoea and after it is over.

Mortality data in the Matlab area shows how well the body adapts to limitation of food. An individual can sustain a very significant degree of malnutrition before the mortality rate goes up; when that happens it goes up very sharply.

The Disease Transmission Working Group studies how diarrhoea is transmitted. They try to identify these agents and to determine the cycles by which they cause the disease so its spread can be blocked. In the field areas it was discovered that rotavirus accounts for half of all the diarrhoeal

episodes throughout the year in young children. In contrast to the importance of rotavirus, the role of parasites in diarrhoea has not yet been well defined in Bangladesh.

In terms of new information this year, two things have happened: (i) the classical strain briefly returned after an absence of seven years, during the winter epidemic, and (ii) more ominous, an antibiotic-resistant *Vibrio cholerae* appeared in 30% of a population in a rural area. The effect of antibiotics on cholera is important because antibiotics shorten and diminish the degree of illness and are therefore an important adjunct to fluid therapies. This antibiotic resistance was associated with prolonged diarrhoea which complicated treatment immensely.

A simple intervention like washing hands with soap and water has markedly reduced the spread of shigella. Index cases were followed from the hospital back to their families. Some families were provided with soap and water, others were not. The results show that this simple intervention had a major impact on preventing the spread of disease. This is certainly far less expensive than either a community water programme or an antibiotic prophylactic intervention. This is an example of a simple intervention that works.

In Teknaf, because of the limitation of fresh potable water, tubewells may be very useful because they would perhaps be the only water source for families. This year marks the beginning of a major community intervention programme to provide people with a good water supply and a proper disposal of waste.

The Host Defense Working Group has done basic research on the immune system of the gut to identify the antibodies in intestines. This Working Group can now measure antibody response both in the blood stream and in the body as well as in the intestinal tract. It has chosen the specific agents for the vaccination against cholera as the means to this. We have had two products which have been studied in the field this year. One is a toxoid vaccine from the Wellcome Research Foundation. The other is a purified fraction of cholera toxin which is not toxic. The studies have shown that an antibody response can be elicited to these products, both locally in the gut and systemically in the body.

The Pathogenesis and Therapy Working Group this year has studied how to interfere with the actions of cholera toxin. We know how the toxin works, also how to devise better and simpler forms of rehydration fluids. There are four current candidates for oral rehydration solution: one is a glucose electrolyte solution with some base added; the next is a refined sucrose solution with the four electrolytes added; another is raw cane sugar. Raw cane sugar has a significant amount of potassium, almost as much as in the WHO mixture, showing that by using natural foods you sometimes gain something. Finally, the most exciting evolution of oral rehydration is that we have now studied more than 200 patients receiving a rice-starch based electrolyte replacement solution. Cereal grains are no more than long necklaces of glucose molecules, which the intestine breaks into glucose by enzymes. Thus glucose is then available to transport sodium and water into the blood stream and rehydrate the individual. Further-

more, these are the things that everyone eats; therefore, there is nothing unusual or risky about measuring them or preparing them. This is perhaps one of the things we are most excited about, the idea that one can combine the standard electrolyte replacement mixtures with a cereal-based solution. This merges the problem of weaning food in nutrition and the treatment of diarrhoea into a simple understandable form for a mother. Doctors and health workers are not necessary except for initial instruction.

With respect to the blocking of the activity of the toxin, two things have been accomplished this year. One is a drug which interferes with the effect of cholera toxin and has been shown to reduce the loss of fluid in cholera. Second, an agent which binds the toxin in the intestinal tract and prevents it from attaching to the gut has diminished the severity of disease.

I have only been able to mention highlights here. There are many other things that have been done, but all of them would be of no use unless they were communicated through a training programme.

The Training Programme is something new for us. It was not in the mandate of the former Cholera Research Laboratory; earlier we had dedicated our effort principally in Bangladesh. I think Dr. Mahler will be please at this. All physicians who are responsible for rural health centres in Bangladesh have now had a one-week practical course at the Centre. We have had many short courses in which medical students, health workers of a paramedical nature, nurses and physicians have come in contact with the work of the Centre. We have also held a National Workshop in which all groups and individuals interested in diarrhoea and its treatment got together for several days, exchanged ideas and made plans as to what might be done within the country. This was a prelude to three regional training courses, the first starting in December for the three WHO regions under the auspices of the UNDP. In addition, it is important to develop people to carry out research. There are fellowships, and a number of research trainees have been a part of our training programme this year in the various disciplines underlying the study of diarrhoeal diseases. Finally, seminars have been a regular activity at the Centre.

Underneath all of this is the logistic support for the people who work in the field by the administration. The total complement now of the Centre is approximately 800 people, most of whom are in the field. Scientific staff, above the fellow level, is approximately 26 at the present time. We have established relationships with many research and other health organizations both within the country and outside of the country. This has been a very active area during the past year.

Mr. M. R. Bashir, Associate Director, ICDDR,B

An operating budget of six million one hundred thousand dollars is proposed for the calendar year 1981. The basic purpose of the 1981 expenditure budget is to bring the activities of the Centre to the level originally foreseen when the International Committee of Governments, international agencies and private organisations cooperated to bring the Centre into being in 1979.

As compared with the programme of the Centre's predecessor organisation, the Cholera Research Laboratory, the 1981 budget adds strong emphasis on research to improve community services and on training, research and communications to disseminate findings and to support national organisations in their own work.

Apart from programme increases, the 1981 budget is significantly larger than the rate of expenditure for 1979-80 as a result of the staff compensation adjustments already mentioned in the Progress Report.

For the year 1982, an operating budget for $ U.S. 7.4 million is proposed. Taking into account an inflation factor of 12%, this would represent an increase of 10% in real terms over 1981, chiefly to support a further increase in training and extension activities.

Details of the Budget are tabulated in Appendix A of the document. While predictions for 1983, 84 and 85 are included, these obviously are speculative. They present a real increase of 5% annually and a continuing inflation rate of 12% a year.

Separate expenditures are contemplated for the construction of new buildings at the Centre's headquarters and for the field stations. These are estimated to cost upwards of $ 11 million over a period of approximately five years.

Of the $ 6.1 million sought for operating costs in 1981, $ 4.8 million are estimated to be available from donors at present. The funds remaining to be found for 1981 therefore amount to $ 1.3 million.

The interest taken by many countries and organisations in the scientific work of the Centre is beginning to have its parallel in the funds which have begun to come forward to support the Centre's programme. A dozen governmental organisations are now contributing to the financial requirements of the Centre. The donor governments and agencies are as follows: Australia, Bangladesh, the Ford Foundation, the International Development Research Centre of Canada, Saudi Arabia, Sweden, Switzerland, United Kingdom, United States Agency for International Development, the Centre for Disease Control, the United Nations Development Programme, the United Nations Fund for Population Activities.

In the case of UNDP, a special arrangement applies. The UNDP contribution for construction, derived from funds originating with the Organisation of Petroleum Exporting Countries, is made towards the cost of constructing and equipping new physical facilities for the Centre. The UNDP contribution for

clinical research is channeled through WHO as part of the UNDP's larger contribution to the WHO Programme for Diarrhoeal Diseases; WHO participates in the administration of the funds contributed.

Apart from the contribution to the capital budget, most of the contributions to the Centre are so-called core contributions, i.e. they are available for general support of the Centre's overall programme. Some contributions, however, are project funds, i.e. their use is limited to specific projects. The Centre prefers core contributions, since project funds are difficult to administer and sometimes fail to cover the full cost of the projects they are intended to finance.

The generation of core contributions continues to be a high priority for the Centre. The Centre is pressing a campaign to enlist further participation in both its technical programmes and its financing. One of the most serious constraints to the development of the Centre is likely to be the availability of funds. Governments and agencies will have an important role to play in improving the situation in this respect.

Mr. M. K. Anwar, Member, Board of Trustees, ICDDR,B; Representative of Bangladesh

There is no question of my great pleasure in being able to participate in this meeting concerning the International Centre for Diarrhoeal Disease Research, Bangladesh. A similar meeting under a different title was held in this very building more than a year ago. Among other business, that meeting selected the first Board of Trustees and acted as midwife for the birth of the ICDDR,B.

I recognize here around the table many known faces, whose active cooperation and support helped the creation of this Centre. Let me take this opportunity of thanking them all, and also to welcome the distinguished delegates to this meeting of the Consultative Group of interested Governments and Organisations.

The previous Speakers have described the disastrous role played by diarrhoeal diseases on the status of human health. It is hardly necessary for me to repeat them in order to impress upon you the urgency of taking action on a global basis to confront this menace. Your very presence here is a testimony to your serious concern about the subject of diarrhoeal diseases in children living in the developing countries. The vicious cycle of diarrhoea and malnutrition very adversely affects the quality of life. About 50% of the children embrace death before reaching the age of 5 years; diarrhoeal disease, accompanied by malnutrition, is one of the leading causes of these deaths.

The concern about the extent and complexity of the problem is now widely shared both in the North and the South. Enteritis and diarrhoea are among the leading causes of illness in children in North America and here. The outbreak

of cholera in some of the Middle East countries is almost a regular phenomenon. The world-wide concern over this subject cannot be over-emphasized.

Diarrhoeal diseases have long crossed over national borders and have assumed menacing proportions to attract the urgent attention of the international community. True development becomes meaningful only if it meets the basic needs of all people. It is in this context of human welfare that WHO has set the call for health for all by the year 2000, which would permit peoples of the world to lead socially and economically attractive lives. That slogan of the WHO has now assumed a much greater significance and has grown into a world-wide movement, which has raised another ray of hope for those who have not been able to gain any meaningful access to organised health services. In this context the Alma Ata Conference is of singular importance, where primary health care was identified as the main strategy of Health for All by the year 2000.

WHO has already recognized the world concern about diarrhoeal diseases and has developed on a priority basis a global collaborative programme for the prevention and control of diarrhoeal diseases. Against this background and magnitude of the problem, the ICDDR,B has been founded on the solid foundations of its predecessor, the Cholera Research Laboratory. This step was in absolute consonance with the concern expressed by health administrators and consistent with the policy adopted by WHO and other international and non-governmental agencies concerned with human welfare. It is therefore legitimately expected that the governments and agencies will take the same amount of active interest in the functioning and funding of the Centre as they had done in its creation.

At the time of bringing the Centre into existence, the interested government and agencies in their meeting in February 1979, held in this very building, indicated a level of standard and coverage for the Centre during the year 1982-85. An operating budget of $ U.S. 6.1 million has been proposed for the year 1981 to bring the activities of the Centre to that level originally foreseen. As already pointed out by Mr. Bashir, of this $ 6.1 million only $ 4.8 million are estimated to be available according to current indications. The balance of $ 1.3 million still remains to be found.

An operating budget of about $ 7.4 million has been proposed for 1982, making allowances for an inflation factor of around 12%. This will allow a real increase of only about 10%. The ICDDR,B headquarters in Dacca is housed mostly in accommodation temporarily provided by the Government of Bangladesh in a part of a building housing some of the Government's other offices. This space, though it had been very helpful, is not sufficient to house the growing activities of the Centre. The Board of Trustees has approved an expansion of the physical facilities, and a project has been approved in principle for construction of a seven-storey building for the Centre.

The first phase of the construction includes the foundations and the ground floor of the building. Estimated cost of the first phase is around $ 800,000, of which about $ 500,000 have so far been made available. The total cost of the main building will be around $ 10 million, and the Government of Bangladesh has agreed to make available 4.0 full acres of land, as already stated by Dr. Sulianti.

The Centre has not been able to develop any housing facilities of its own for the members of its staff. This has acted as a serious constraint to retaining qualified staff. Besides the cost involved, providing housing is of high order; it would be economical for the Centre in the long run to develop its own housing complex.

Operational facilities available at Matlab and Teknaf, the two field stations of the Centre which are the real laboratories of the Centre, are frankly, of a nominal order. It is necessary to expand and extend the facilities, including provision of staff housing, and the Centre has initiated steps towards that.

As I have stated earlier, the international community has acted as midwife for the birth of this Centre and has discharged very effectively its responsibilities in nursing this Centre during the first year. All of them deserve to be congratulated for the effective participation in the matter of the functioning of the Centre. The mandate given to the Centre is of an international order, so that the Centre may make an effective contribution in the matter of diarrhoeal diseases and other related problems and live up to the expectations of the world community. The international community, particularly the comparably fortunate ones will, it is expected, come forward to play a more effective role in the functioning of the Centre during the coming years.

During the outgoing year the Centre has developed relationships with many countries and has further strengthened the collaboration with a number of participating countries and organisations. A number of countries have signified their participation in the activities of the Centre by signing the Memorandum of Understanding.

The Centre, besides other things, requires men and money. In order that participation may become more effective and meaningful, I wonder whether or not it is possible to devise some ways or means through which each of the participating countries and organisations may be enabled to make some contributions towards the Centre. Such contributions may be of nominal order and need not be of significant amounts. I am quite conscious of the difficulties of devising such procedures and would like to leave it at that for consideration by the distinguished delegates.

The presence of Dr. Mahler and Mr. Morse have certainly lent an additional weight to this meeting, attended by so many distinguished personalities concerned with human welfare. The statements made by Dr. Mahler and Mr. Morse have only strengthened our convictions that the two organisations, the WHO and UNDP, are solidly behind this Centre.

The main function of the ICDDR,B is prevention and cure of diarrhoeal diseases and it is about time I stop before someone makes a diagnosis of verbal diarrhoea in me.

THE WHO GLOBAL PROGRAMME ON DIARRHOEAL DISEASES

Dr. M. H. Merson, Medical Officer, WHO

I would like to tell you briefly something about our programme. My task here will be to provide merely an overview of the WHO Diarrhoeal Diseases Control Programme, so that you can appreciate the important role being played by the ICDDR,B. A lot more information is available in the pigeon-holes which provides a 1978-79 global summary of the programme.

The Organisation launched this programme in May of 1978, when some 150 Member States at the 31st World Health Assembly requested WHO, and I quote from the Resolution 31.44, "to intensify involvement of Member States in the development of a plan of action for an expanded programme of diarrhoeal diseases control, and specifically to promote formulation, implementation and evaluation of national programmes, including the training of health workers at different levels, and to accord high priority to research activities for the further development of simple, effective and inexpensive methods of treatment, prevention and control."

I should stress here that, although diarrhoeal diseases have long been recognized as a major public health problem in developing countries, much of the world's and the Organisation's efforts until that time had been directed primarily towards the control of cholera. This resolution was the first definitive commitment of the WHO World Health Assembly and Member States to combat the problem of all diarrhoeal diseases on a global scale, and called for a programme that would include activities in control, training and research. I should also add that the adoption of this resolution was very much in line with the international commitment to primary health care and to confronting health problems that cause high mortality and morbidity and, as we have heard very well expressed, affect the quality of life of infants and young children in the developing world. In that same month WHO established and convened a technical advisory group composed of outstanding scientists and public health administrators to recommend global objectives, strategies and research priorities for the programme. This group is continuing to review the programme's activities on an annual basis - its last meeting was held in January 1980 - and the report of the meeting is also available in the pigeon-holes for those of you who are interested in more detail.

The Programme has set as its immediate objective the substantial reduction of diarrhoea - related mortality and malnutrition, especially in children. At the same time it is striving towards the longer term objective of reducing diarrhoeal morbidity. In order to achieve these objectives the Programme is being built up on two main components. On the one hand, a health service delivery or control component, concerned with the incorporation of existing knowledge on the treatment and prevention of diarrhoeal diseases in international primary health care programmes; on the other an action-oriented research component through which support is being given to both operational or applied research to determine the best means of applying available knowledge, and to goal-oriented basic research to develop new and better tools for prevention and treatment, such as vaccines and drugs.

Now I will briefly describe these two components. In the service or control component, the emphasis has been on promoting the following strategies or approaches: first, as Dr. Greenough has pointed out, to reduce diarrhoeal mortality the treatment of acute diarrhoea as early as possible in the course of illness with oral rehydration therapy, using a balanced glucose salt solution. I wish to stress that this, as Dr. Greenough has pointed out, is accompanied by the education of mothers to feed children as soon as possible during diarrhoea and in convalescence. The solution recommended by WHO and UNICEF for oral rehydration therapy, otherwise known as ORS, has not only been proven effective for treating dehydration from diarrhoea of any etiology in all age groups, but has also been shown to have a beneficial nutritional effect in children.

Our second approach to decrease diarrhoeal morbidity, is the promotion of the improvement of maternal and child care practices that are important for the prevention of diarrhoea, especially uninterrupted breast-feeding, preparation of safe weaning foods from locally available food products, good domestic and personal hygiene, and adequate nutritional support to pregnant and lactating mothers. We are also promoting environmental health, especially national efforts that encourage the proper use and maintenance of drinking water and sanitation facilities that are designed to conform to the needs and practices of the local populations.

Our third major approach is the establishment or strengthening of national systems for epidemiological surveillance of diarrhoeal diseases as a way of measuring the impact of national programmes and to detect epidemics, especially cholera, which continues to be an important public health problem in many countries in Africa and Asia. A global target has been set for making oral rehydration therapy accessible to 25% of children below the age of 5 years in the developing world by 1983. This, we believe, is an attainable target. The cost of ORS has now been reduced to 6.5 cents for a one litre packet and the packaged ingredients are thought to remain stable under tropical conditions for as long as five years. The cost of setting up an ORS production plant to produce five million packets a year is about $ U.S. 150,000; UNICEF, as a full partner in the programme, is extending support to countries that wish to produce ORS locally or is helping them to import the required quantities.

Other major activities in this component of the programme include first, collaboration with the governments in the planning and implementation of national diarrhoeal diseases control programmes. To date some 97 countries have shown interest in developing programmes, and about 70 have actually taken steps with the cooperation of WHO and UNICEF to plan and develop programmes. Secondly, the preparation of technical manuals and materials for use in national training efforts. Thirdly, the undertaking of a series of management training courses for staff responsible for carrying out national diarrhoeal diseases control programmes. The first course will be conducted a number of times over the next three years with the participation of senior level staff from all countries having national diarrhoeal disease programmes. In 1980-81 a similar course will be developed for mid-level national health managers.

These courses focus in particular on the best means of implementing diarrhoeal disease control activities in the context of primary health care, and on building an evaluation scheme for use in assessing the impact of such programmes.

Lastly, we are establishing an information system to provide countries with information on recent advances in diarrhoeal diseases and on useful experiences in country programmes. I should emphasize that at the country level a great effort is being made to link up diarrhoeal disease control activities with activities in related programmes, such as maternal and child health, environmental health, nutrition, immunization and family planning. Particular attention is being paid to integrating diarrhoeal disease control activities with those that will be implemented in the forthcoming International Drinking Water Supply and Sanitation Decade.

I would like to emphasize that, although we realise that most of the support for country control programmes will need to be generated by the countries themselves or through bilateral sources, we strongly believe that the global WHO activities that are under way, while they represent only a fraction of the total effort required for these programmes, will undoubtedly provide an important contribution, especially in the areas of programme planning, evaluation and training, toward the eventual success of national programmes.

A brief word now about the research component. The research component of the programme has been planned to be in line with and responsive to changes in the needs of the services component, which in turn is providing a mechanism for early field application of research findings. In addition to supporting operational and basic research, the programme is focusing on strengthening developing country institutions to make them self-reliant, and on encouraging research collaboration between existing institutions in developing and developed countries. A special effort is also being made to collect and disseminate new research findings.

To determine the operational and basic research priorities for the programme during the past two years, nine scientific working groups and sub-groups were convened, with the participation of 64 scientists from 19 developing and 8 developed countries. These groups met on a one-time basis to set initial priorities on the basis of a comprehensive review of knowledge in a number of disciplines. Within the last months the management scheme we will use to support research has been implemented. It utilises the process of pre-review to ensure objectivity and fairness in the selection of projects for funding. It is a plan formulated following numerous discussions and consultation with the WHO global advisory Committee on Medical Research, many national staff responsible for research activities, representatives of the UNDP and the World Bank, and the Technical Advisory Group of the Programme. In many ways it resembles the plan of the Organisation's special programme for research and training in tropical diseases. In short, it involves the formation of three global, Scientific Working Groups to coordinate and direct basic research, and regional groups or analogous bodies at each of our Regional Offices to perform similar functions for operational or applied research. These groups are composed of leading scientists from outside WHO and are responsible for preparing a research plan, deciding upon the funding of proposals submitted to WHO for support, and

coordinating the research being undertaken by WHO with research in similar fields conducted elsewhere. The assigning of the responsibilities of operational research to our Regional Offices ensures a close relationship between the operational research and services parts of the programme.

The funding of research projects has just been initiated. Based on our anticipated resources, our target is to fund by 1983 a minimum of 100 projects with a focus on the developing countries. We hope that these projects will expand upon some of the important recent research breakthroughs, many of which Dr. Greenough has described, including major advances in the understanding of the causative agents in diarrhoea and the means by which the body defends itself against them, as already mentioned, the simplified approach to treatment - oral rehydration therapy.

Through this effort it is envisaged that by 1983 an extensive, global network of institutions undertaking research in diarrhoeal diseases will have been established.

With this background I am sure you will agree that the ICDDR,B can make an enormous contribution to this global effort as a well-equipped research centre in a developing country where diarrhoea is a major problem. The Centre can provide important new information of the causes and treatment of diarrhoeal disease and about ways in which the human body defends itself against the diarrhoeal pathogens. Moreover, with its unique field areas, the Centre can quickly organise studies of new interventions of potential use in national diarrhoeal control programmes to assess their feasibility and effectiveness. The Centre is also performing an important training function, as you have heard, in the areas of microbiology, epidemiology, immunology and clinical management of acute diarrhoea. In this sense it constitutes a resource of inestimable value particularly to the countries of Asia, but also to other regions, for the training of manpower for the national control programmes. As Dr. Mahler mentioned, to formalize its pivotal contribution, the Centre has been recently designated a WHO Collaborating Centre; through this mechanism the Centre's research and training facilities are closely interwoven with those of the global programme.

Mr. A. A. Muhith, Representative of Bangladesh

I am standing in for the Minister for Health, who is a Member of the Board of Trustees and was very keen to attend this meeting, but at the last moment could not do it. In fact, I came to know that I would be at this meeting only two days before I left Dacca for another purpose. However, it gives me great pleasure to be with you here this morning and it is my most pleasant duty to thank you all for taking interest in this Centre. Particular thanks are due to Mr. Mashler, Mr. Zagorin and his organisation for setting up this Consultative Group and inviting all of you to this particular meeting. To all the participants who are here I would like to extend our deepest appreciation and thanks for the interest you have taken and, to Dr. Mahler and Mr. Bradford Morse who honoured us with their presence this morning, I would say thank you very much for giving a very good start to this Consultative Group. It is indeed gratifying to note that a national organisation, supported additionally by four Governments including our own, obtained the support during its existence as a national institution for almost 20 years, of the United States, United Kingdom and Australia, followed by the Ford Foundation, and now we have 22 agencies who have accepted this organisation and its special role. In an area the importance of which has been underscored by all the speakers who have preceded me, we are indeed fully committed to this institution, which I said has now a history of about 20 years. We would like this institution to prosper and be of service not simply to the people of Bangladesh, but to all people who have problems of diarrhoeal diseases. When the move for internationalisation began, one of the points which was very strongly emphasized by our Ministry of Health was the dissemination of knowledge of the research products which this institution would be producing. The other point which was emphasized very greatly was how the national objectives, the international objectives, the national perspective and and the international perspective could mesh. Another point was the training and extension arm, which is at the very foundation of this institution. As you have learned from Dr. Greenough, almost all the doctors working in the rural areas in Bangladesh have gone through some training in this institution. That is exactly what we have got to do in order to see that the results achieved by this institution are actually translated into action in the field and are actually available to people; not simply in Matlab and Teknaf, the two experimental stations, but to the 68,000 villages of Bangladesh and hundreds of thousands of villages in other countries - not simply of our region, but in other areas too.

On behalf of the Government of Bangladesh I would just make one appeal here; that appeal is that the institution needs support, both in terms of monetary resources and in human resources. We have to find the best people to run this institution, who can contribute to the success of this institution. And we have to provide them with enough support so they can carry out their objectives. It is a matter of great pleasure to us that we are hosting this institution. We

have set apart an area of land which in current terms costs about $2.5 to 3 million for the expansion of the facilities of this institution. We are also providing assistance, largely in-kind, with various utilities and other facilities; that comes roughly to an annual contribution of nearly 0.5 million dollars.

We appreciate that with our resource constraints we may not be able to do much, but we stand fully committed to do whatever is possible for us and whatever is demanded by the Board of Trustees and the Consultative Group. With these words I welcome you all to this meeting. Thank you very much for taking an interest in it; on behalf of the Minister of Health I offer his felicitations to you.

COMMENTS BY MEMBERS OF THE CONSULTATIVE GROUP

Dr. H. Al-Dabbagh, Representative of Saudi Arabia

On behalf of the Government of the Kingdom of Saudi Arabia I have the greatest pleasure to say that my Government offered with pleasure to the International Centre for Diarrhoeal Disease Research, Bangladesh, a grant of a quarter of a million dollars for construction of the first floor of the Centre. In addition to that, is another grant $ U.S. 100,000 each year for the coming five years.

Dr. I. F. Setiady, Representative of Indonesia

The diarrhoeal diseases constitute a major public health problem in Indonesia; thus, we will be one of the recipient countries of the ICDDR,B services. As is known, Indonesia has given full attention to this problem which is reflected in the ongoing activities in the control and training programmes on diarrhoeal diseases.

One of the important programmes is the promotion and distribution of oral rehydration solution (ORS), which started in 1971. In the beginning, the Government faced many difficulties and resistance, even from the Health Staff, including the doctors. But through special efforts, we succeeded in introducing ORS in the community and at present ORS can be obtained in all health centres throughout our country.

Another important programme is the combination of ORS with the Nutrition and Family Planning Programme, with the assistance of various United Nations agencies such as UNICEF.

Another programme in this field of diarrhoeal diseases is what we call the safe-water supply and latrine programme. This has a special budget from what we call the Presidential Instructions -- a special budget given by the

Government to important programmes. This programme, however, has not yet been evaluated.

I think that the ICDDR,B can definitely be a focal point for developing appropriate technology in diarrhoeal diseases control, and for providing training to scientists, communicable disease control managers and epidemiologists in the provinces. As Dr. Greenough mentioned, appropriate technology in oral rehydration should be further developed for use of mothers. This International Centre, as Dr. Mahler mentioned this morning, can apply TCDC very well. We all can benefit from this Centre.

Mr. J. F. Giovannini, Representative of Switzerland

I would like to convey the satisfaction of the Swiss Government with the developments at the ICDDR,B so far. We also appreciate the importance of the work and the way it is done, and renew the existing contribution to the Centre. We also pledge a new contribution of 2 million Swiss francs to the Centre. As far as future research is concerned, we would like to emphasize the need to disseminate the results to the general population. It is, therefore, necessary that the research should bear on the means of communication to make the results accessible to poor rural inhabitants. For this purpose, the experience of other countries, as underlined by my Indonesian colleague, is very important. It is not worthwhile to produce medicine that cannot be easily available to the general masses.

Dr. M. S. Mohieldin, Representative of Egypt

The comments on progress and achievements at the ICDDR,B are great; but it would be better if the dissemination of all reports of important developments in the field of diarrhoea were more extended and regular. There is a geographical mistake: El Tor does not lie on the Persian Gulf, but on the Suez Gulf in Egypt.

Whenever referring to training or seminars, I would prefer if reference were made to all developing countries, not necessarily only to Asian countries. Developing countries are not necessarily in Asia; they are in Africa, Latin America and in the Middle East itself.

Egypt is now establishing what we could call a modest sub-centre to the ICDDR,B. We are planning to exchange knowledge with the mother centre at Dacca. We are mainly studying the positive agents; epidemiology and a few clinical studies will be also conducted. This sub-centre which Egypt is developing will carry out studies in the Cairo area and in Shakai Province.

In the Report, I noticed that some organisms that are known to be important causative agents of diarrhoea were not included; for example, salmonella, which is an important cause in some countries, including Egypt. Shigella was referred to in the report when it was stated that washing the hands reduced the incidence, but further studies to evaluate its importance as a cause should be undertaken. Some studies of doubtful pathogens, I believe, should be included.

The financial support of Egypt to the ICDDR,B is agreed upon in principle for the time being; but it is too early to decide the sum and the year in which it is going to be paid. My colleague, Dr. L. El Sayad, may have more comments on the clinical aspects and the paediatric aspects of diarrhoea.

To reiterate on the dissemination of knowledge: one of the goals of the ICDDR,B is the dissemination of knowledge on diarrhoea. I think that this is not sufficient. It has to be more, especially on the research work and all important papers on diarrhoeal diseases.

As to the question of training, seminars and workshops, it was always mentioned that they are to be held "in Asian countries". I would like that to be replaced by "developing countries". If we have seminars or workshops in the Middle East or in one of the Latin American countries, this will demonstrate the international nature of ICDDR,B.

Dr. L. El Sayad, Representative of Egypt

In Egypt a nationwide programme on diarrhoeal diseases control started early in 1978; now we have a good network of 3,000 health units all over the country. ORS is used by all the health units. I feel that cooperation with the International Centre (ICDDR,B) is very important for exchange and dissemination of information and also to answer questions for our programme developers in Egypt. There are so many questions that need to be answered through research. I feel that there is an opportunity to benefit from such research centres.

In the area of training, I feel that we should have more information on the contents of such training, the duration, whom to train, what personnel are needed, etc. Education and training are very important for the implementation and success of any programme. The programme in Egypt is still young; it is only two or three years old. But, for it to be effective all these areas should be effectively marked. For example, there are so many studies comparing the home-made formula with the prepacked formula. We are trying to answer this question in Egypt, but I feel it should be answered on a worldwide basis. We heard this morning from Dr. Merson that an ORS package costs 6.5 cents, this is not very expensive and within the purchasing power of any country.

There are so many questions like this which can be raised and communicated by the International Centre. ICDDR,B may be of great benefit for the success of the global diarrhoeal disease control programmes.

Ms. H. Freeman, Representative of Australia

Australia believes that the Centre is doing excellent work and I would just like to pass on some comments made by our Mission in Bangladesh. Our Mission there enjoys a good working relationship with the Centre. The Director and his staff have always been readily available to discuss the Centre's activities, or to arrange visits to its facilities. This has allowed Australia to monitor our contributions more quickly and accurately than is often possible in other aid projects of this kind. So undoubtedly we are pleased with the kind of relationship that we have with the Centre.

One primary objective is to make the resources and findings available to other developing countries and we are pleased with the progress already made in this area.

I would like to address myself to the nature of the Consultative Group that is meeting here. We believe that it is a good idea, as a forum where donors and interested parties can become aware and discuss the activities of the Centre. However, we do have one particular comment that we would like a reaction to. We wondered if it might be possible for the Group to embrace a set of like-minded institutions in addition to the Centre. The existence of both a Board of Trustees and a Consultative Group for one Centre may be a somewhat top-heavy arrangement. Moreover, we think that the arrangement of linking a group of like-minded Centres provides the basis for increased interactions and mutual encouragement and stimulation. I think that when scientists get together, they get stimulation which comes from interaction. I would also like to mention that we are hoping to make a modest increase in our 1980-81 contribution to the Centre, although of course this will be dependent on the annual budget considerations.

Mr. W.T. Mashler, UNDP

Speaking on behalf of UNDP, I would like to raise a few points. I need not go into UNDP's support of the Centre or the Diarrhoeal Diseases Programme of WHO. We have already demonstrated by our financial and other inputs our major interest in it, and you have heard from Mr. Morse and Dr. Mahler earlier today what we intend for the future. Our commitment to this cause is of a long-term nature. However, there are a number of questions which I would refer to and on which perhaps later on we could get responses.

UNDP, together with other donors around this table including the World Bank, is involved with other international endeavours such as the Consultative Group of International Agricultural Research (CGIAR), which has amongst its centres a few that are now operating in Bangladesh and elsewhere. The two significant examples of agricultural operations in Bangladesh involve the International Rice Research Institute and the International Maize and Wheat Improvement Centre which have done major work there. This work also includes socio-economic studies, which relate very closely to the nutritional needs of the people

affected. On the other hand, the ICDDR,B is concerned with nutritional aspects on the medical side. It seems to me that here would be an ideal area for collaborative arrangements, if for no other reason than to exchange data.

The International Food Research Institute in Washington is a third Centre within the Consultative Group concerned with gathering and interpreting data. They are vitally interested in nutritional data, particularly in Bangladesh. The Director of IFRI asked us to what extent other UNDP Programmes in Bangladesh could conceivably be the subject of a piggy-back operation by IFRI. It seems to me that here is an ideal area where collaborative arrangements can be made.

We have outside the Consultative Group the Special Public Works Programme for Least Developed Countries, to which a number of donor agencies around this table are making contributions. In Bangladesh there are a number of drinking water supply operations under the Public Works Scheme, which is employment-oriented and has a nutritional element provided by the World Food Programme. Here, data can be gathered and additional inputs can be obtained by the Centre. I am not suggesting that these are of major importance, but they could be important; perhaps some arrangements could be made to interface with those programmes. Mr. Zagorin and UNDP in Bangladesh could be instrumental in assisting. Incidentally, this is true also in other countries.

The third issue that concerns me, and that has to do with WHO and ICDDR,B, is the relationship of ICDDR,B through activities undertaken under the Drinking Water Decade. It is an area which is very directly related to public health and diarrhoeal diseases. It seems to me that here the Centre can also interface, not necessarily in terms of the World Programme that is evolving in WHO on research in diarrhoeal diseases, but in a major programme that has attendant importance to the issue and vice-versa.

Finally I would like to raise the question of women. A large part of the extension work and the applied work that the ICDDR,B is undertaking is at the village level through women. It may well be a good reason to emphasize the importance of the role of women in development. There is no question that in the field women are a key element in the use of the rehydration packages, in the area of family planning and in the area of water use. In the Drinking Water Decade the role of women needs to be enhanced. This is a very central area where we can pull together a whole number of pieces that fit together and truly create an integrated system. All too often we have talked about integration in the abstract. There is now a case to be made. I am not suggesting that all the points that I have raised can be implemented readily, but certainly some of them may be, and should be pursued with vigour. I would suggest that the points I have raised perhaps again be subject to a summary reply by Dr. Greenough later on.

Dr. M. Jegathesan, Representative of Malaysia

First of all I would like to thank the organisers for inviting Malaysia to attend this meeting. We are not yet a participating country in this programme, but diarrhoeal diseases are an important problem in our country and the Ministry of Health is naturally interested and concerned about any programme that will control this problem.

The Institute for Medical Research (IMR) is the richest arm of the Ministry of Health of Malaysia and also is the WHO Regional Centre for Research and Training in the Tropical Diseases Research Programme. In the Institute, we have a special interest in diarrhoeal diseases research and have an enteric research committee. Therefore, the IMR is particularly interested and impressed with some of the activities of the ICDDR,B. There are certain areas in which we can readily see how there could be closer cooperation and collaboration with the Centre, such as the obtaining of information on research findings which could be utilized in Malaysia, advice and research project methodology, training in designated disciplines, assistance with regions, and in working out collaborative projects. Similarly, the IMR could perhaps provide some assistance to the Centre staff in certain regular courses, or in short-term training programmes which the Institute runs.

These are the areas in which the Centre and the Institute could collaborate, either directly or perhaps through the intervention of WHO. But for the moment, any formal participation of Malaysia in the Centre can only come about after the Malaysian Government has had sufficient time to study the implications and considerations that will come about should this participation be formalized. It will be my task to take back to the Government of Malaysia as much information as I can, regarding the workings and functions of the Centre and the implications of a formal participation.

Dr. G. F. Brown, Representative of the Population Council

One element that has not been mentioned in this discussion, although it was highlighted in this morning's presentation, is the outstanding work that the ICDDR,B has undertaken in the area of integrating elements of family planning with selected health services in the rural outreach programme. It has been recognized in Bangladesh and in other countries as very important to integrate family planning and high fertility prevention with health, nutrition, breast-feeding, water-supply and other elements of rural development. This is a part that needs to be strengthened, or continue to receive attention as a part of an overall integrated programme. This work has gained recognition in other parts of the world. I would ask that consideration be given for further strengthening of this element as an integral part of improved health in all parts of the world, as consideration is given to broader programmes of diarrhoeal disease control and research within the WHO context and in other international forums. I would like to add this to the list of items that Mr. Mashler mentioned

about possible or desired extended linkages of ICDDR,B with other aspects of development. I would also like to say that the Population Council, as a professional organization in the field, is pleased to continue to collaborate closely with ICDDR,B in its work in Bangladesh and hopes to do so in the future as well.

Dr. O. Harkavy, Representative of the Ford Foundation

On behalf of my colleagues of the Foundation, I want to express great appreciation to WHO for hosting this meeting and especially for the splendid way in which the Centre has progressed. I think this is one international centre that seems to be working extraordinarily effectively and is making many contributions, as has been pointed out this morning.

This Centre is a remarkable place, in which collaborative research and services can be tested on an analytical basis. Most interesting research has been produced showing the relationships between nutrition, health and fertility, and the corresponding relationships between infant mortality and fertility. I think the literature has been enriched very substantially by those contributions. I was extraordinarily impressed by the chart that Dr. Greenough showed on behavioural patterns, indicating that there is an enormous increase in contraceptive uptake when it is combined with a package of needed health services. I would like to concur with Dr. Brown's interest in hearing more detail about this phase of the work.

I do want to report with great pleasure that just the day before yesterday our office approved a second grant of $ U.S. 200,000 for support for the International Centre; it is our hope that an additional sum will be forthcoming in the next year.

As an economist rather than a physician I am always worried about money. We should consider some sort of concerted effort by the donor community, as well as by the Family of Nations, to support this enterprise along with those with which it is intimately tied, such as the Diarrhoeal Diseases Programme and the Tropical Diseases Research Programme of WHO. Here we have a very good organizational infrastructure which needs to cover a variety of activities. I think a lot of us need to figure out how to assure an ever-increasing flow of funds for this range of inter-related activities.

Dr. J. A. B. Nicholson, Representative of the United Kingdom

I should like to say on behalf of the Government of the United Kingdom how impressed we are with the progress of the ICDDR,B during its first year of operation. We like what is being done. We are impressed by the way that the research divisions have been made - community services, nutrition, disease

transmission and so on. This seems a sensible way of organizing it. We are particularly impressed by the concept of more community services research and increased training and we also like the balance of research as judged by the papers which are attached to this document. We notice a strong element of field research, which can lead quickly to activity in this and allied areas which are so important. There is one observation we would like to make. When you get a change of management or arrangement you do tend to have some people leaving the organisation. I understand that there is a shortage of senior scientists at the moment. I should like to ask how the centre is approaching this problem.

Despite our cuts in public services, including our branch of the Foreign Commonwealth Office, ODA, we are hoping to maintain this year's contribution. Unfortunately I cannot give a final decision on that because it is still subject to approval of the Aid Framework, by Ministers, but we are hoping to maintain the 1980-1981 level. I do not see any prospects of increases yet.

Dr. B. B. Karki, Representative of Nepal

At the very outset I would like to thank you for inviting Nepal to this meeting. I do not want to take much time elaborating about the gravity of problems in our country; whatever problems there are in Bangladesh, we have almost the same. We have been promoting oral rehydration solution for the last four or five years through the media, radio, and pamphlets. In the last two or three years, we have been promoting home-made rehydration solutions; our main effort is to reach the maximum number of mothers in rural areas, because we feel our our main problem lies in the rural areas where 95% of our population lives and where the majority of children die. Recently we have been having a research study on home-made rehydration solutions with the help of WHO. We have been trying three methods, to see which can be used best in the rural areas, especially by rural women. It is too early for me to say what the results of this research are.

As in Bangladesh, we are very much tempted to use rice starch, crude sugar and honey. In our rural areas, sometimes honey is more available than sugar, so we are very much tempted to try this. Because of ICDDR,B, I am very happy about the proximity of Bangladesh to Nepal. Any development going on in ICDDR,B encourages us very much. At this junction I can only say we are eager to contribute to ICDDR,B activities in whatever possible way we can.

Dr. K. Velauthapillai, Representative of Sri Lanka

We from Sri Lanka do very much appreciate the work done by this Centre and the Cholera Research Laboratory for the last twenty years. The problem of Diarrhoeal Diseases in Sri Lanka is not different from that of Bangladesh and

recently during outbreaks of cholera and shigella dysentery, we were able to apply the findings of the Centre and control these diseases. We are very glad that this Centre is widening its scope and including research on all diarrhoeal diseases. We are also happy that from a national participation, with the help of a few countries, it has now grown into an International Centre with international participation. We have been beneficiaries to a certain extent. We have been sending our medical personnel to the ICDDR,B for training with the assistance of the WHO. We are very happy to be participants/beneficiaries. The nature of assistance that could be given to the Centre will be soon decided by our Government.

Mr. R. Lederman, Representative of Canada

I want to express the appreciation of the Government of Canada for the invitation to attend this meeting. I wish to explain that, as it has already been communicated to the Chairman, we are here as observers; but, of course, we came with very high interest in health programmes and health services where we are traditionally very strong. This is a high priority area for us. Unfortunately, we are currently in a budgetary retreat, and regret that we cannot make an announcement of contributions to this Centre. I should make this known, because of the need for the Centre to assess their expectations. Please be aware that we want to maintain an interest, though we cannot contribute as much as we would like to, but we would like it to be made known that we retain our spiritual support.

I am very interested in knowing the activities of the Centre and I am pleased to hear the expressions from agencies that are collaborating, how meritorious the work is. I am pleased by the presentation made this morning. I shall take this back to those of my colleagues who have an interest in the health sector. We will continue to watch the progress and certainly will be interested in knowing the efforts being made in the practical extention of the research being done. I am very happy to see these genuine and serious efforts and I am sure this will be noted by my colleagues in Ottawa.

I have two questions. One has been asked already by the representative from Egypt - the question of the extension of the benefits to other developing countries. It was not too clear, at least to me, how the benefits are going to be extended to countries outside Asia. Related to this question is the mechanism by which developing countries, recipient countries, can benefit from the work of the Centre to make it truly international.

I am unable to say anything positive about any forthcoming contribution from Canada. Mr. Mashler just mentioned UNDP's contribution and the third cycle he foresees in continuation of UNDP's support. This of course is related to the portion of the resources that are available to global and inter-regional country programmes. In this regard Canada has supported the increase in the proportion of resources to the inter-country programme and thereby indirectly, or directly, depending on the perspective, benefitting such projects as the ICDDR,B.

Dr. Pang Qi-Fang, Representative of China

I am very glad to know that in Bangladesh there is a Centre doing special research on diarrhoeal disease. It is very important because through this contact, we will have more exchange of scientific information and exchanges of workers.

According to the record of 1979 from China, there were 85 confirmed diagnoses of cholera. Roughly one million suffered from dysentery, but we do not know the total number of cases of viral diarrhoea. Only in the Peking area we have detailed knowledge. In the winter, there is a very high peak of diarrhoea cases; the cause of this peak is rotavirus. Besides this is adenovirus which also causes diarrhoea. The majority of diarrhoea however, is caused by rotavirus.

In May there is another peak, but we don't know the cause. In 1978, I found in the stool of patients a very small virus, the size about 22 nanometers. It seems to be an RNA virus, but I cannot confirm this because my evidence is little as yet. I will continue the study and do my best to prove it.

In China we have three groups studying diarrhoeal diseases. One is the bacterial diarrhoea study group, and two study groups focus on viral diarrhoea. The first Viral Study Group is for the infant diarrhoea which is caused by rotavirus, and the second is the Adult Viral Diarrhoea Study Group. It is to be organized within five or six institutes. We are very glad to share with the scientists of all countries. We will have more contact and exchange of information, which will benefit both the Chinese people and the peoples of other countries.

We will be very happy if it is possible to cooperate with the Dacca Centre and we wish to have a good relationship with other institutions all over the world. We can progress quickly this way.

Dr. J. Dizon, Representative of the Philippines

Allow me to express the deep appreciation of my Government to the UNDP/WHO for their interest in diarrhoeal disease research and control and, specifically, for the establishment of the International Centre in Dacca, Bangladesh. I would like to express our congratulations to the Board of Trustees which is very ably headed by Dr. Sulianti, for excellently nursing the Centre, and to the Director, Dr. Greenough, and his staff for the excellent work that they have done in such a short period of time. His report on the accomplishments is certainly impressive.

We share diarrhoeal diseases as a public health problem; we are instituting immediate control. We have started a small oral rehydration programme and hope to expand this with the assistance of WHO and UNICEF. And of course, realizing the immunology and control of diarrhoeal diseases, we are intensifying our programme on environmental sanitation.

With reference to the collaboration and participation with ICDDR,B, I hope it is understood that as a developing country we are not at this time in a position to provide nor extend material contributions, but we would like to assure that within our limited capacity, technical collaboration will be there, specifically in the field of training and research.

In the field of training, with WHO and UNDP assistance we propose to put up a Regional Centre for training in diarrhoeal diseases in the Western Pacific Region and we propose to send our trainers of these training courses to the International Centre in Bangladesh, in the clinical and epidemiological fields as well as the training fields. We are, of course, looking up to the Centre for consultation and guidelines in the methodologies for making training more effective.

In the field of research, we welcome exchange of information and materials. We are looking up to the ICDDR,B as our point of reference for information and research studies in connection with the programme in our country. We have not yet the impressive list of research studies that Dr. Greenough and his staff have been doing. We hope that more research in the field of environmental sanitation can be conducted, and this related to the transmission of diarrhoeal diseases.

Dr. L. M. Howard, Representative of the United States

I think it would be very useful to point out that we do note and appreciate the enormous progress which has been made during the first year of the new Centre. It is very pleasing to note, first of all, the firm support by the Government of Bangladesh. I think that is basic. It has been very helpful to date to note the strong and official support that has been provided from there. We are very pleased with the Board of Trustees and the individuals who have been chosen, such as, the distinguished Chairman of the Board, Dr. Sulianti, and the Director, Dr. Greenough. It is a Board that holds a lot of international credibility. We certainly support it.

We are very pleased with the Scientific Programme, its breadth, its progress and its special efforts to disseminate findings of the Centre through training and education. Given the importance of the diarrhoeal diseases problem globally, obviously the Centre's relationship to this parallel effort by the WHO and UNICEF initiating the "health for all by the year 2000" programme is crucial. It is quite clear that the work of the International Centre is going to have a very important catalytic effect in providing technical guidance and direction in one of the single most important elements, which is in fact the content of any programme which you wish to call primary health care within the "health for all by the year 2000". It would be in that sense somewhat inappropriate to have any meeting under the roof of WHO and not recognise any other major events which are taking place in toto. Therefore we tend to view this meeting not just as an ICDDR,B meeting as such but a very important element, a very unique element, in

the entire primary health care activity. This is largely because this is one of the disease problems which will have to be faced and will have to be undertaken well, if there is to be any measurable achievement in the reduction of morbidity and mortality by the year 2000. We think the context and the perspective are correct, the interrelationship not only of diarrhoeal diseases as such, but the relationship to the obvious related factors - nutrition, fertility and environmental sanitation and so forth. And it is very pleasing to hear from the Director and from Dr. Sulianti some of the progress which has been made in this direction.

In this context, commitment obviously would need to be a long-term one. There should be no illusions that the Centre can be a success or survive on short-term help. If we all have agreed as Member Governments to support health for all over a period of at least 20 years (needless to say this disease problem is not going to be solved totally in 20 years), it is going to require sustained effort for at least that length of time. We have here a country from which the classical vibrio disappeared for some time. A method has been found to recognise that it is reappearing. We find out that a new form of disease of antibiotic resistant vibrio is now apparent. This, again indicates that unless the methods for very carefully following the disease and its solution are continued, then it is quite clear that no automatic solution is going to be applicable over a period of a decade. Consequently, we feel that a long-term commitment for a long-term pursuit is essential. In this context, too, it is a global problem. The internationalisation of the Centre was welcome and was essential.

With regard to support to the Centre, the Agency for International Development has stated its position already at the time of the Interim Committee in February 1979. In a very few words, and I will quote verbatim exactly what it says, "... AID also intends to consider annual contributions of up to $ U.S. 1.9 million in each of the next five fiscal years 1980 through 1984, subject to the availability of funds and subject to mutual agreement annually between ICDDR,B and AID to proceed ...." That commitment remains, and I believe the initial funding of the first $ 1.9 million for calendar 1980 has been paid.

Dr. R. Al-Owaish, Representative of Kuwait

I take the privilege of expressing my deep gratitude to the UNDP for extending an invitation to participate in the meeting for the Consultative Group of the International Centre. The Government of Kuwait is willing and, prepared to support the Centre, and will decide after reviewing the objectives, tasks and ways of running the Centre. Also, we received the whole document very late, which did not enable us to decide our participation. I am really impressed by the progress of the Centre and the presentation given by Dr. Greenough about the Centre. I am going to present a report to the Government of Kuwait after this meeting which will be of great help in our decision to participate in this Centre.

We have some diarrhoeal disease problems in Kuwait, and some mortality due to gastroenteritis. We recommend that there be more research studies on salmonellosis which we consider the biggest health problem in Kuwait.

Mr. Zagorin, on behalf of UNFPA

UNFPA is contributing alongside UNDP. UNDP is making a contribution from its global funds and from its regional fund. This regional contribution is directed not at the Centre itself, but for the training and extension programme, mentioned earlier, which WHO is organizing.

In addition to those regional and global UNDP funds, UNFPA is making a contribution from its Country Programme for Bangladesh and its Regional Programme. The Regional Programme includes a one-time contribution toward the purchase of a computer, but is also principally focused on training.

Although this is subject to some revision, the grant will be approximately $ U.S. 600,000 for the current fiscal year 1979, then approximately $ U.S. 600,000 for the three subsequent years. Roughly half of the amount each year will come from the UNFPA Regional Programme and half from their Country Programme.

Dr. L. Freij, Representative of Sweden

I would like to take the opportunity to point out that in Sweden we have been very impressed with the developments of the ICDDR,B, particularly with its operational research activities in the field, which are of direct relevance to the primary health care; also with the building up of the training activities, which has been very impressive. I would like to underline that these services would also be of great value to non-Asian countries; this was pointed out by some other delegates.

Sweden is one of those countries that is giving project support to the ICDDR,B. I would like to add that I am here as an observer and that I am not in the position to give any indication at present about any further Swedish contribution. I can assure you that we are going to follow the development of the Centre with a very positive interest, especially with regard to its role as a collaborative centre with the WHO Diarrhoeal Diseases Programme.

Dr. Greenough III, ICDDR,B

I will answer the remarks from this morning in the same order they were made. There were many nice comments; particularly helpful interest which might bear fruit in the near future.

The statement by the delegate from Saudi Arabia is particularly gratifying because of the five-year commitment to the central activities of the Centre. It also provides us with full support for the construction of the new facilities. I do not think it came out this morning, but until two years ago, patients were cared for in a tent. A tin shed which is an extention of a Government building now is used. The Institute of Public Health has been very patient to accommodate this sort of camp arrangement for many years. We are handling about 130,000 patients this year in the Treatment Centre in Dacca alone. This is perhaps not something to be proud of, although it is a very good activity. It illustrates that we need to get out into the community. It will be a real challenge in the next decade to have communities take up the majority of this treatment load from a central facility. In any case we are very happy to have the long-term contribution of Saudi Arabia for the new hospital.

I recently spent some time in Indonesia. Actually, Indonesia has considerable knowledge on how to treat diarrhoea. They have a number of ideas concerning the implementation of ORS and its possible modifications. This may be an interesting area for collaborative work. We have had a lot of interaction between Indonesia and the Dacca Centre.

The interest and generous contribution of Switzerland is greatly appreciated. It will permit us to embark on a vigorous programme to extend the fruits of our research to rural populations of Bangladesh and other developing countries.

I would like to express my thanks for the scholarly correction of our document about the quarantine-station at El Tor, where *Vibrio cholerae* El Tor was named. I have to get my geography sorted out with the delegate after the meeting. With respect to Egypt and their diarrhoea projects, we are very interested. There are certainly things in common between the Nile Delta and Ganges River Delta. They are both heavily populated. They both have a very good flow of fresh water and I am sure many problems are similar. One thing I heard which was very interesting is that they have a great deal of salmonella. We have almost no salmonella as a cause of diarrhoea in Bangladesh. This is one of the regional differences that may be important. I am interested in the sub-centre activity; perhaps when we have an opportunity to get together, either in Egypt or Bangladesh, we can explore it further.

The next comment was from Australia. I am very intrigued with the possibility that certain-like minded institutions might meet to establish a forum. Perhaps Mr. Mashler would like to comment. I would also like to express my appreciation to Australia for their long sustained interest and support to the predecessor Cholera Research Laboratory and their continuing support to the ICDDR,B. I also would mention that we have currently one of our senior people in immunology working on a fellowship training in Australia. We appreciate that we have people there and we have a good technical linkage with them.

The next comments were from the Chairman, UNDP, mentioning a list of institutions and activities in Bangladesh with which we have some relationship. In the Ordinance, there is a mandate for a Programme Coordinating Committee, which has been established and will be implemented in the next several months. Mr. Mashler's comments suggest the desires of expanding the membership of such a Committee to include some of the other international groups in Bangladesh. The mandate of the Committee was specifically to integrate the work of the Centre with Bangladeshi national institutions, and we will have to discuss whether there could be some participation with other institutions doing similar work. In any case, we would certainly like to be in touch with them. We have not had much sharing with the agricultural group as yet. We appreciate those suggestions.

I am delighted to hear the comments of the Malaysian representative. I have recently been in Kuala Lumpur and met several people there. I think there is a very good community of interest just across the Bay of Bengal. We are quite close and I would look forward to establishing a fairly vigorous exchange and collaboration with Malaysia. I think that could be very fruitful and I look forward to it with pleasure.

The Population Council was modest. They have helped us to recruit a very able individual within the last three months and they are providing indirect support for that individual. Their support and interest in this Centre and its activities has been very helpful and we look forward to their continued participation. We can expect to see output in some of the studies which I mentioned briefly this morning, with respect to the utilization of contraceptives during a period of open distribution and during a period when they are integrated into an overall health services programme. One challenge, though, is that one third of the population is not that much - it is better than 8 or 10%. What we are looking at now are interventions that might bring that up to a higher level. I suspect this will require more expertise in the social sciences, focused in the areas of the Community Services Research Group. I know that this has been an interest of the Ford Foundation particularly, and I would simply say that we have it very much in mind. I feel that the social context of the diarrhoeal diseases and their related problems is very important. We are taking active measures to recruit individuals with this kind of expertise.

The United Kingdom has been a long-term supporter of the Cholera Research Laboratory as a Charter member and has continued to support us with people, with interest and with funds. We look forward to their continued participation. With respect to recruiting, I might elaborate on Dr. Nicholson's question about recruitment of scientists. We are losing some senior staff within the next several months. Right now we have lost two scientists from the United States. We have recruited two new scientists, one from Sweden and one from France. There is a balancing of country participation in this process happening in a very natural manner. No individual can be replaced but, on the other hand, no one is totally indispensable, either. I look forward to some fresh approaches and some different ideas with the new staff which is from different countries.

I might point out that currently our Community Services Research Programme Head is from a developing country, India. We have advertised internationally for all positions in a wide forum of journals. The advertisement closes June 30. We have had a good response. We will be reviewing these applications. I think we are in reasonably good shape on recruitment. That is not to say that I would not enjoy any suggestions from any member here in terms of interested people. We are always anxious to hear about qualified interested scientists or people who would like to come as visiting scientists, or fellows at any level. I encourage people to try to let us know if there are such people which would have an interest in working in Bangladesh.

I am very interested by the comments from the delegate from Nepal, a close neighbour which has a very active programme in diarrhoeal diseases and oral rehydration which we have followed with great interest over several years now. We unfortunately, do not have as much direct contact as I would like to have. I am particularly interested in the ideas about honey as a basis for the oral rehydration solution. I would like to know more about that. One question I would have, though, is whether honey which is principally a fructose or fruit-sugar would be as effective as glucose. Fructose is not recognized as a good carrier of salt and water across the intestine. I do not know the answer to that, but I am intrigued with using any natural substance that is available in homes in rural areas. We would be very interested in getting together and talking about it and even trying it out perhaps.

Sri Lanka has had a number of people with us in the past year through the WHO Fellowships. I think this is one of the outcomes of developing a training programme: WHO identifies people who are interested, and they visit us. It is very gratifying to hear that these people go back and that the ideas are taken up, implemented and things happen. Also I know we sent one of our best bench workers from the Laboratory to Sri Lanka to establish some of the current methodologies for identifying the causes of diarrhoea, so this has been a very nice start at collaboration and I look forward to more in the future.

The Canadian representative was a bit modest. The Teknaf project came into being through the support of IDRC of Canada. Teknaf is the area where we are doing a major community water and latrine intervention, and it is receiving continued and essentially full support by IDRC, which thereby has been a very strong presence at the Laboratory. We would also like to have the participation of the Canadian Government.

During the last three weeks we had the representatives from the Shanghai Institute for Biological Products with us in Dacca. We learned something more about the Chinese activities on the side of biological production. We were extremely impressed with the wide range of materials and diagnostic reagents as well as vaccines. There were some very intriguing things in relation to some of the vaccines, such as the pertussis vaccine. I am particularly delighted to have the presentation by the delegate this morning about the causes of diarrhoea in and around Peking. The double peak is exactly as we see it in Bangladesh, but probably due to different agents. The rotavirus however, around the world seems to be a winter disease, peaking in December in Bangladesh, China, the United States, Europe, etc. The finding of another virus affecting adults is of course very interesting and we would like to know whether this would explain some of the 15% of cases we cannot diagnose as yet in Bangladesh. We would welcome further exchanges with China.

The delegate from the Philippines is one of the founders of the Cholera Research Laboratory (CRL). I recall that Dr. Dizon was present at its birth, almost twenty years ago. It is very nice to see him here now for ICDDR,B, the successor of CRL. We currently have one of our senior scientific staff in Manila at an oral rehydration conference in the Western Pacific Region. We have

had increasingly active exchanges and collaborations with the Philippines, and one of our staff in demography was from the Philippines. So we will look forward to an extension and increase in that relationship.

The previous and present support of U.S.A., both financial and otherwise, has been very crucial at each step in the history of the institution. We continue to be grateful for this and particularly appreciate Dr. Howard's comments. I think it goes without saying that the long-term contributions are of particular importance.

Kuwait has been an important participant. A member of the first Board Trustees has been from Kuwait. We are looking forward very much to collaborating with Kuwait. I am also interested in the salmonella which has been mentioned and is quite different from the Bangladesh situation. We apologize if our documents have come to you late, and we fully understand this puts you in a position where you cannot make any definite statements.

Finally on the UNFPA contributions. I can say that the computer has arrived and is being assembled. We hope it will work; this is a vital component of the data processing activities, because data from the field areas have required a great deal of processing outside of Bangladesh in developed countries. It has had limited access, for instance, by fellows who might come in for training in areas of demography, social sciences, epidemiology. So, we are looking forward to a gradual transfer back of most of our data processing to Dacca over the next two-year period.

We have very active scientific collaboration with Sweden. I mentioned that scientists from Sweden are joining us this summer. There has been good productivity in the area of gut-immunity and studies of the drugs which alter the course of cholera through this collaboration.

Several people have noted that the dissemination of information is crucial. We are concerned about this and are doing certain things. I would call your attention to the list of publications. We have also established in the last year and a half, an internal publications system. A list of all these publications is available here, if anyone wishes to look at it. These are things that might not be published for a year - things that might never be published at all. The internal publication is our attempt to get the latest information out, which may be delayed in actually reaching the world literature. In addition, we do publish a monthly newsletter, that has a section which gives a review of some of the findings of the national workshop. It also lists all the protocols that are passed and are in operation and all publications. These are our efforts to inform the rest of the world community about what we are doing. It would be nice if it were plugged into the WHO Information System, when it is possible.

Dr. Zahra, WHO

Perhaps I could elaborate on a key question which came across, *viz.* how does one ensure a mechanism which will bring about collaborative effort together with a certain sense of coordination at a global, regional and country level; or, the other way around, as Dr. Mahler mentioned this morning.

In fact, that concern and some of the reflections of this morning were echoed in a much more universal way only last month at the World Health Assembly. Through that, I would like to mention what sort of mechanism exists today which might facilitate this pooling of resources and efforts toward our objectives. This programme has very special strength; not only do we have a programme which holds immediate prospects for immediate impact to cut down on infant mortality, but it is increasingly linking up in other areas related to development.

It is very closely linked with the other efforts in the international drinking-water supply and sanitation decade, the nutrition action programme, and the epidemiological surveillance which includes cholera. This morning there was some concern on the epidemic of cholera, and other aspects of child care and family health. These linkages go beyond the immediate, I would more than agree with Mr. Mashler, when he linked women and development. If ever there was a person that is being focused into the programme it is really the mother, as the front line worker at the time of crisis when the child badly needs to be rehydrated. All these linkages are to be seen in a long-term perspective as well as the immediate objectives.

On the issue of how is a collaborative effort ensured in a programme of this complexity. Here, I would like to very briefly touch on some of the points that Dr. Merson mentioned, and focus on the fact that through the Organization there is an overall Technical Advisory Group of outstanding scientists who review and define objectives, strategies and approaches, some of which are being carried out by the Centre. Policies, guidelines and approaches are reflected at the regional level and in each of the six regions of the Organization through the mechanism of the Organization. There are regional planning groups of senior national administrators involved with this programme and the other related programmes.

In each of the Regions there is a body that first looks at the overall strategies earlier mentioned, and then see how in their own Regions they would plan a programme in diarrhoeal diseases. This is then translated at the country level in the form of Plans of Operations. Through the same regional planning group, monitoring and evaluation goes on; and this is a most valuable mechanism. If, it were not for this regional planning group, we could not have identified where the relative strengths are. For example, Dr. Dizon was referring to the establishment of a national training institution in the Philippines; the same will be in Malaysia and then the same possibly in Lahore, Pakistan, all of which will link with the Centre. They would form networks of excellence, of strength. Together, the various centres would review how they could help each other. This would be a true beginning of technical cooperation between institutions and

countries. The mechanism which the Organization is finding most valuable is through these regional planning groups. This is in terms of programmes which try to implement what is known.

When we turn to research, we have exciting developments, which Drs. Greenough and Merson mentioned this morning. You have the scientific community and the pharmaceutical industry, finding that they would like to get together and accept some of these challenges - some of the advances that were mentioned this morning such as better knowledge in immunity, especially gut immunity, prospects for vaccine and new drug development such as the anti-secretory agents, etc. So again, there is stimulation in the community to do more research to be applied to some of the problems we have talked about this morning. Here again is the collaborative mechanism that brings the scientific community together to address themselves to these challenges. It is here the Organization has the Global Advisory Committee on Medical Research which with the Technical Advisory Group reviews the areas, and the gaps in research globally. These are then taken up by the Regional Advisory Committees on Medical Research, so that within their own Regions they can select their priorities in relation to the gaps.

The Diarrhoeal Diseases Programme has now been accepted as a priority by all six Regions, including Europe. Scientific groups now will address themselves to each of the five areas earlier referred to by Dr. Greenough. How do we address ourselves to problems in our own regions? Who is going to do that bit of research? Is it the Dacca Centre? What is going on in Kuala Lumpur and China in terms of these studies? Through collaborative effort we have a truly dynamic role. This is why the role of the Centre is a pivotal one. Here is a real Centre with a history which is one of its several other areas of strength on which to build this overall collaborative effort. The programme is so challenging that every bit of mobilization of strength and resources is needed. It was, indeed, very welcome this morning to see your support to the Centre's role.

I think that we have touched on one of the most interesting points, and that is the importance of dissemination of information. I think that this is a crucial area. This is one area in which one could use the "we," the global effort, in terms of producing valuable information and training material. It is one in which we are finding the greatest satisfaction. Perhaps this information will be very useful.

Dr. Merson, WHO

We have taken three approaches for information dissemination. One with the help of Mr. Mashler, we have been able to have a WHO Collaborating Centre in the U.K., publish a global newsletter, the first edition has gone out and will be going out four times a year. This newsletter has a distribution of about ten thousand right now and it is directed to workers in diarrhoeal diseases mostly in country programming and national activities as well as universities. The second approach is similar to the TDR approach in which initial summary of the programme with a form has been mailed out. This is to build up a mailing list within a programme of research scientists, similar to what TDR has done with their global Newsletter. We have just initiated this with a mailing list of about 600 names of scientists. And the third approach, also used by TDR, is the annotated bibliography approach. We found, there was a great need for information on oral rehydration therapy.

With the able assistance of USAID, the CDC and United States got together and published an annotated bibliography on oral rehydration - it is a summary of about 150 papers. It is now being translated into French and Spanish and is being distributed.

In addition, with the help of Professor Birchstem of Sweden, we would use the Medler search system in collaboration with the National Library of Medicine in the United States to summarise abstracts epidemiology and clinical studies. We will use our mailing list for distribution. These are just some of our initial thoughts and we are open to any other suggestions.

Dr. Sulianti, ICDDR,B

Since some of the delegates mentioned the necessity of information dissemination and the fact that the Centre was not adequately filling this need, I thought that perhaps WHO could do this. Being a large organisation, however, WHO has a significant bureaucracy. Perhaps with input in this area the Centre could play a role as a WHO collaborating Centre. Discussions could be held on how we can help other countries receive information and overcome the difficulties which I know are being faced.

Mr. Mashler, Chairman

I must admit that after a lifetime of perseverance and bureaucracy I sympathize with the vagaries of bureaucracy in this direction. Whenever one talks about money, bureaucracy is at its best and I sympathize. Recipients are usually impatient to get the money and cannot move because somebody else is sitting on it. I think that in the case of the number of activities that we are now undertaking we are breaking through that barrier. I can say with some conviction that not all international organizations are totally atrophied, they are only partially atrophied. We started in the area of tropical diseases and I think we are going to break through the area of diarrhoeal diseases.

We are making a very major effort to establish these various activities as identities in their own right, their own management without bureaucracy, a minimum of bureaucracy, so that we can look at the science of the issue and not at the impediments that usually stand in the way. I can assure you that in that part of the UNDP for which I am responsible we have been making a very major effort in that direction. I think some of the results are beginning to show. I am pleased to say that at the other end of the spectrum, it is usually individuals in international organizations who insist in breaking through the red tape. We have been fortunate in the case of Dr. Zahra and others in WHO to have been able to do this. It is not an easy process, but I would like to hold forth some hope in this world: there is some light at the end of the pipeline. I can assure you that we will do our best. I do not say this lightly; we are doing it. Some of us may not survive it, but in the meantime we will try. Given the prerogative of the Chairman, I would like to say that UNDP has already made a commitment for a period of five years, starting roughly in mid-year 1979, of an annual contribution of roughly $ U.S. 300,000 for five years. As I indicated before, UNDP will start its third programming cycle covering a period of five years in 1982. While it is obvious that the commitment for a period of five years will carry over into the next cycle, even within that cycle this present period of commitment comes to an end. We intend to put into our programme a substantial amount of support to diarrhoeal diseases research. Of course the Centre will be a beneficiary. I am not willing to say at this point how much that will be, since the Governing Council is still debating the base figure for support to UNDP itself; it would be rather presumptuous of me to make any commitment at this time. Nevertheless, commitment is with the Centre, with the Diarrhoeal Diseases Global Programme of WHO, and will continue to be so, for a considerable period of time. You have that commitment from us. We do know that the commitments by donors, bilateral or multi-lateral or non-governmental, are being negotiated individually. Part of this process of the Consultative Group is to give an opportunity to those who are participating to say publicly what their share will be. From what I see, indicates that what we have is sufficient to assure us that there will be continuing support. In moral terms, we have wholehearted support in the future of this programme from those who are participating here today.

I do appeal, as others have before, that those who are participating in this Group must realize that in any endeavour of this kind, the long-term commitment is an absolute prerequisite if that operation is to survive and to

thrive. That was the initial purpose of our commitment to internationalisation and in the long run to its support. Therefore, those of us who last year committed ourselves to the long-term objectives of the Centre must now also find the resources with which to support it.

I do hope that in that process not only developed but also developing countries, who after all have a stake in their own survival and in their own developing process, will be able to find the means to make contributions to the Centre. I, therefore, appeal to you when you return to make every effort to do so. I do mention here non-governmental organisations - in the case of non-governmental organizations, of course, I refer to the Ford Foundation and the Population Council which one way or another have been materially supportive of the Centre. In fact, they have been essential cornerstones in the development of the Centre. I apologize if I did not mention them specifically.

OTHER BUSINESS

Mr. Mashler, Chairman

I believe that Ms. Freeman of Australia raised the question as to what will be the future of this Group? We in UNDP, together with WHO and the World Bank have been in active negotiation with WHO over the creation of a Diarrhoeal Diseases Research Programme. Reference to this has been made by Dr. Mahler, Dr. Merson and Dr. Zahra. The programme is in its infancy. We hope that within the next year or so we will see its evolution into a major programme, but at this particular point it is not possible to predict when a programme of this kind will come into being.

The internationalisation action of February 1979, requires us to account for the activities of the Centre to those who were participants in it. We felt that it was necessary to call a meeting of this kind. The timing coincided with our Governing Council meeting, which gave an opportunity to a number of countries who were representatives at our Governing Council and particularly to those from the Aid Programmes, to be present and not to have to duplicate attendance in terms of travel, etc. If, indeed, a global diarrhoeal diseases programme were to come into being under some kind of international mechanism, this Consultative Group mechanism would no longer be necessary because we might be able to combine the kind of accounting mechanism that we have at the moment.

I would therefore suggest that you leave it to UNDP, particularly to myself, to judge what is necessary or not. We are keenly aware of the fact that funds for a meeting of this kind will have to be met out of international pockets. I am not a great admirer of international meetings, both in terms of the time factor as well as the cost factor. I will assure you that we will not call any meeting unless it is absolutely necessary. On the other hand, I feel that unless another international mechanism of the kind that we mentioned in terms of a global programme were to come into being, those who are contributors as well as recipients would have to know at some point what was happening. I think it is only proper and right to give some accountability in public of what the Centre is doing, to have questions asked of the Centre as to what is happening to public funds, since there is no other mechanism for it. I would like to assure Ms. Freeman and all others that we will be extremely careful not to waste the taxpayer's money, and will not call a meeting unless it is absolutely necessary. Unless another mechanism comes into being, it is my intention to call a meeting of this kind at an appropriate time in 1981, with a minimum of cost and a minimum of time to be wasted. I hope that this answer will be satisfactory to all concerned.

Last year we prepared a Memorandum of Understanding, which enabled those who wished to adhere to the objectives of the International Centre to sign it without obligation of contribution. We felt that the Memorandum of Understanding

would hopefully, and I underline hopefully, result in additional funding. Nevertheless, there are several major contributors who have not adhered to it, and I wonder if they are prepared to sign it. If they wish, they may do so after this meeting is adjourned.

May I say at the closing of the meeting that I want to thank our host, the WHO Director-General; Dr. Zahra; Dr. Merson; the Press Staff; the Interpreters; all of you and all the members of the international centres, who have contributed to this meeting in a very meaningful way. What they have done has kept this meeting a relatively short one but nevertheless a very significant one. I would like to say to those who participated in it, that I am most grateful for the intellectual contributions that have been made by those who have spoken. I am particularly impressed by the fact that the representatives of developing countries have been so forthcoming in their comments as to what they can contribute in intellectual terms to the work of the Centre, to a programme of larger proportions, and to indicate in what way the Centre might serve them. I think in that sense alone the meeting was an extremely useful one.

ICDDR,B (CRL) publications can be obtained from Publication Unit, International Centre for Diarrhoeal Disease Research, Bangladesh, G.P.O. Box 128, Dacca - 2, Bangladesh.

A. CRL Annual Report 1976.

CRL Annual Report 1977.

CRL Annual Report 1978.

ICDDR,B Annual Report 1979.

B. Working Paper:

No. 1. The influence of drinking tubewell water on diarrhoea rates in Matlab Thana, Bangladesh by George T. Curlin, K.M.A. Aziz, M.R. Khan. June 1977 (Rep. Sept 1978). 21 p.

No. 2. Water and the transmission of El Tor cholera in rural Bangladesh by James M. Hughes, John M. Boyce, Richard J. Levine, Moslemuddin Khan, George T. Curlin. Dec 1977 (Rep. Mar 1980). 27 p.

No. 3. Recent trends in fertility and mortality in rural Bangladesh 1966-1975 by A.K.M. Alauddin Chowdhury, George T. Curlin. Jan 1978. (Rep. Oct 1979). 14 p.

No. 4. Assessment of the Matlab contraceptive distribution project - implications for program strategy by T. Osteria, Makhlisur Rahman, R. Langsten, Atiqur R. Khan, Douglas H. Huber, W. Henry Mosley. Apr 1978. 25 p.

No. 5. A study of the field worker performance in the Matlab contraceptive distribution project by Makhlisur Rahman, T. Osteria, J. Chakraborty, Douglas H. Huber, W. Henry Mosley. Jul 1978. 17 p.

No. 6. Constraints on use and impact of contraceptives in rural Bangladesh: Some preliminary speculations by R. Langsten, J. Chakraborty. Aug 1978. 23 p.

No. 7. The demographic impact of the contraceptive distribution project by T. Osteria, W.H. Mosley, A.I. Chowdhury. Sept 1978. 17 p.

No. 8. Development of milk teeth in rural Meheran children of Bangladesh by Moslemuddin Khan, George T. Curlin. Sept 1978. 23 p.

No. 9. A follow-up survey of sterilization acceptors in Matlab, Bangladesh by Makhlisur Rahman, Douglas Huber, J. Chakraborty. Oct 1978 (Rep. Jul 1980). 31 p.

No. 10. The Demographic Impact of Sterilization in the Matlab Village-Based MCH-FP Program by T. Osteria, S. Bhatia, J. Chakraborty, A.I. Chowdhury. Nov 1978 (Rep. June 1980). 23 p.

No. 11. Parental dependency on children in Matlab, Bangladesh by Makhlisur Rahman. Dec 1978. 28 p.

No. 12. An areal analysis of family planning program performance in rural Bangladesh by T. Osteria, S. Bhatia, A.S.G. Faruque, J. Chakraborty. May 1979. 19 p.

No. 13. The people of Teknaf: births, deaths and migrations (1976-1977) by Mizanur Rahman, M. Mujibur Rahaman, K.M.S. Aziz, Yakub Patwari, M.H. Munshi, M. Shafiqul Islam. May 1979. 46 p.

No. 14. Pilot Study of the Calendar Rhythm Method in the Matlab Area of Bangladesh by Stan Becker, Rasheda Akhter. Nov 1980. 23 p.

C. Scientific Report:

No. 1. Double round survey on pregnancy and estimate of traditional fertility rates by A.K.M. Alauddin Chowdhury. Jul 1977 (Rep. May 1978). 28 p.

No. 2. Pattern of medical care for diarrheal patients in Dacca urban area by Moslemuddin Khan, George T. Curlin, Md. Shahidullah. Aug 1977 (Rep. June 1978). 20 p.

No. 3. The effects of nutrition on natural fertility by W. Henry Mosley. Aug 1977 (Rep. Aug 1978). 25 p.

No. 4. Early childhood survivorship related to the subsequent interpregnancy interval and outcome of the subsequent pregnancy by Ingrid Swenson. Aug 1977 (Rep. Apr 1979). 18 p.

No. 5. Household distribution of contraceptives in Bangladesh -- the rural experience by Atiqur R. Khan, Douglas H. Huber, Makhlisur Rahman. Sept 1977 (Rep. Dec 1979). 19 p.

No. 6. The role of water supply in improving health in poor countries (with special reference to Bangladesh) by John Briscoe. Sept 1977 (Rep. Feb 1979). 37 p.

No. 7. Urban cholera study, 1974 and 1975, Dacca by Moslemuddin Khan, George T. Curlin. Dec 1977 (Rep. May 1980). 24 p.

No. 8. Immunological aspects of a cholera toxoid field trial in Bangladesh by George T. Curlin, Richard J. Levine, Ansaruddin Ahmed, K.M.A. Aziz, A.S.M. Mizanur Rahman, Willard F. Verwey. Mar 1978. 16 p.

No. 9. Demographic Surveillance System - Matlab. Volume One. Methods and procedures. Mar 1976. 28 p.

No. 10. Demographic Surveillance System - Matlab. Volume Two. Census 1974 by Lado T. Ruzicka, A.K.M. Alauddin Chowdhury. Mar 1978. 48 p.

No. 11. Demographic Surveillance System - Matlab. Volume Three. Vital events and migration, 1975 by Lado T. Ruzicka, A.K.M. Alauddin Chowdhury. Mar 1978. 45 p.

No. 12. Demographic Surveillance System - Matlab. Volume Four. Vital events and migration, 1975 by Lado T. Ruzicka, A.K.M. Alauddin Chowdhury. Mar 1978. 48 p.

No. 13. Demographic Surveillance System - Matlab. Volume Five. Vital events, migration, and marriages - 1976 by Lado T. Ruzicka, A.K.M. Alauddin Chowdhury. Mar 1978. 55 p.

No. 14. Ten years review of the age and sex of cholera patients by Moslemuddin Khan, A.K.M. Jamiul Alam, A.S.M. Mizanur Rahman. May 1978. 18 p.

No. 15. A study of selected intestinal bacteria from adult pilgrims by M.I. Huq, G. Kibriya. Aug 1978 (Rep. Feb 1980). 15 p.

No. 16. Water sources and the incidence of cholera in rural Bangladesh by Moslemuddin Khan, W. Henry Mosley, J. Chakraborty, A. Majid Sarder, M.R. Khan. Dec 1978. 19 p.

No. 17. Principles and prospects in the treatment of cholera and related dehydrating diarrheas by William B. Greenough, III, Jan 1979. 20 p.

No. 18. Demographic Surveillance System - Matlab. Volume Six. Vital events and migration 1977 by Aporn Samad, Kashem Sheikh, A.M. Sarder, Stanley Becker and Lincoln C. Chen. Feb 1979. 65 p.

No. 19. A follow-up survey of sterilization acceptors in the modified contraceptive distribution projects by Shushum Bhatia, Trinidad Osteria, J. Chakraborty and A.S.G. Faruque. Feb 1979. 25 p.

No. 20. Cholera due to the El Tor biotype equals the classical biotype in severity and attack rates by Moslemuddin Khan and Md. Shahidullah. Mar 1979. 20 p.

No. 21. An estimation of response bias of literacy in a census of rural Bangladesh by M. Shafiqul Islam, George T. Curlin and K.M.A. Aziz. Mar 1979. 26 p.

No. 22. *Vibrio cholerae* by William B. Greenough, III. Apr 1979. 43 p.

No. 23. M.R. clients in a village based family planning programme by Shushum Bhatia and Lado T. Ruzicka. Apr 1979. 26 p.

No. 24. Passive hemagglutination assays for quantitation of cholera antitoxin: gluteraldehyde and chromium chloride used as coupling reagents to sensitize human erythrocytes with purified choleragen by Ansaruddin Ahmed, Kh. Abdullah Al Mahmud, George T. Curlin. June 1979. 25 p.

No. 25. Investigation of outbreak of dysentery due to *Shigella sonnei* in a small community in Dacca by M.I. Huq. June 1979. 21 p.

No. 26. Indigenous birth practices in rural Bangladesh and their implications for a maternal and child health programme by Shushum Bhatia, J. Chakraborty, A.S. G. Faruque. July 1979. 24 p.

No. 27. Isolation, purification and characterization of a Shigella phage by M.I. Huq, M.A. Salek. July 1979. 18 p.

No. 28. Growth and development studies: Meheran by Moslemuddin Khan, George T. Curlin, J. Chakraborty. July 1979. 33 p.

No. 29. Report on reactigenicity and immunogenicity of Wellcome Cholera Toxoids in Bangladeshi Volunteers by Robert E. Black, Md. Yunus, Aub Eusof, Ansaruddin Ahmed, M.R. Khan, David A. Sack. July 1979. 55 p.

No. 30. Strongyloides Stercoralis Larvae recovered from patients with diarrhoea and dysentery by G.H. Rabbani, Robert H. Gilman, Asma Islam. July 1979. 18 p.

No. 31. The condom in rural Bangladesh -- A special efforts is needed by Douglas Huber, Makhlisur Rahman, J. Chakraborty. Aug 1979. 14 p.

No. 32. The Matlab contraceptive distribution project by Makhlisur Rahman, W.H. Mosley, Atiqur Rahman Khan, A.I. Chowdhury and J. Chakraborty. Dec 1979. 119 p.

No. 33. Epidemiologic study of dysentery cases of Dacca Urban Area by Moslemuddin Khan, Md. Shahidullah. Jan 1980. 30 p.

No. 34. The Gut as an immune organ by A.M. Molla. Feb 1980. 51 p.

No. 35. Microbiological surveillance of intra-neighbourhood El Tor cholera transmission in rural Bangladesh by W.M. Spira, Y.A. Saeed, M.U. Khan, M.A. Sattar. Mar 1980. 39 p.

No. 36. Lobon-gur (common salt and brown sugar) oral rehydration solution in the diarrhoea of adults by M.R. Islam, W.B. Greenough III, M.M. Rahaman, A.K. Azad Chowdhury, D.A. Sack. Apr 1980. 19 p.

No. 37. Utilisation of a diarrhoea clinic in rural Bangladesh: Influence of distance, age and sex on attendance and diarrhoeal mortality by M. Mujibur Rahaman, K.M.S. Aziz, M.H. Munshi, Yakub Patwari, Mizanur Rahman. June 1980. 22 p.

No. 38. Birth care practice and neonatal tetanus in a rural area of Bangladesh by M. Shafiqul Islam, M. Mujibur Rahaman, K.M.S. Aziz, M.H. Munshi, Mizanur Rahman, Yakub Patwari. July 1980. 19 p.

No. 39. Hours of onset of cholera classical and El Tor and Diarrhoea by Moslemuddin Khan. Aug 1980. 18 p.

No. 40. Socio-economic differentials in mortality in a rural area of Bangladesh by Stan D'Souza, Abbas Bhuiya, Mizanur Rahman. Nov 1980. 31 p.

D. Special Publication:

No. 1. Management of cholera and other acute diarrhoeas in adults and children - World Health Organization. Sept 1977. 26 p.

No. 2. Index to CRL Publications and Scientific Presentations 1960-1976 by Susan Fuller Alamgir, M. Shamsul Islam Khan, H.A. Spira. Aug 1978. 70 p.

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