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August 1979

# R E P O R T

on the

# REGIONAL SCIENTIFIC WORKING GROUP MEETING ON DIARRHOEAL DISEASE CONTROL

Amman, Jordan

11 - 14 June 1979

The views expressed in this Report do not necessarily reflect the official policy of the World Health Organization.

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## I OPENING OF THE MEETING

The Regional Scientific Working Group Meeting was held under the general Chairmanship of H.E. Mr A. R. Rawabdeh, Minister of Health, Jordan, who welcomed the participants and congratulated Dr A.H. Taba, Director of the Eastern Mediterranean Office of the World Health Organization, for his choice of place, as well as for the selection of eminent experts on the subject.

Dr A.H. Taba's message was then read by Dr R. Cook, WHO Regional Adviser for Maternal and Child Health, who conveyed Dr Taba's greetings to the Group.

The two messages are attached as Annexes I and II.

## II NOMINATION OF OFFICERS

The following meeting officers were proposed and elected:

| | Chairman | Rapporteur |
|---|---|---|
| Monday, 11 June | | |
| Opening: | Dr M. Abul Dahab | Dr S. Sagar |
| 1st Session: | Dr Y. Muftah | |
| Tuesday, 12 June | | |
| 1st Session: | Dr L. Zaki | Prof. G. Billoo |
| 2nd Session: | Dr Lotfi El Sayyad | |
| Wednesday, 13 June | | |
| 1st Session: | Dr P. Rezaie | Dr J. Sulieman |
| 2nd Session: | Prof. Razia Rehmatullah | |
| Thursday, 14 June | | |
| Closure: | Dr M. Abul Dahab | Prof. Shaukat Raza Khan |

## III ADOPTION OF THE AGENDA

Dr M. Abul Dahab presented the Agenda, which was considered and adopted without amendments.

WHO EMRC

## IV INTRODUCTORY REMARKS BY THE SECRETARY OF THE MEETING

Dr R. Cook, WHO Regional Adviser on Maternal and Child Health, presented the objectives, organization plan and explanation of the mechanics of the Meeting. The objective was not only to exchange technical information and the results of research and studies, but also to come up with recommendations for a plan of action for WHO collaboration with the countries, and with UNICEF, for the control of diarrhoeal diseases during the next few years.

## V REVIEW OF EPIDEMIOLOGICAL DATA AVAILABLE ON ACUTE DIARRHOEAL DISEASES IN THE REGION

### 1. Present situation

Current knowledge on acute diarrhoeal disease epidemiology in infants and young children in the Region was reviewed. While surveillance is inadequate, it is clear that acute diarrhoeal diseases exact a formidable toll of lives, and leave a lasting impact on the survivors.

The countries of the Region have, altogether, over 11 million births per year; over 240 million inhabitants; of these, over 45 million are under five years of age and they have a very high mortality and morbidity from diarrhoeal diseases. Among infants alone, nearly 750 000 deaths from diarrhoeal diseases occur annually. Diarrhoeal diseases are a leading cause of hospitalization. Epidemiological studies, in some countries, showed that there were approximately four episodes of acute diarrhoea per year in children of 6 to 36 months.

### 2. Aetiological agents

During the past two decades, investigators from many countries have contributed significantly to the state of knowledge concerning the causes of diarrhoea, mechanisms of fluid loss, and the means of transmission of enteric infections. Laboratory studies have led to the recognition of a wide range of pathogenic agents, including Rotavirus, Salmonella, Shigella, Vibrio cholerae, V. parahaemolyticus, enterotoxigenic or invasive Escherichia coli (ETEC and EIEC), Yersinia enterocolitica, Campylobacter jejuni and Gardia lamblia, which account for about 80% of diarrhoea cases.

#### 2.1 Rotavirus

Rotavirus is widely recognized as one of the most important causes of diarrhoea in infancy, accounting for more than one third of all cases between six months and two years of age. Its role in our Region is not yet known. It has been reported as an

important nosocomial pathogen. The fact that solid natural immunity occurs after infancy raises hopes that a vaccine may be developed.

2.2 Salmonellae

Salmonellae, long recognized as leading enteric pathogens, are assuming increasing significance in this Region. Information from several countries of the Region reveals a sharply rising incidence of salmonellosis, particularly in children.

2.3 Cholera

In 1978, an unusually high attack rate in infants of cholera outbreaks was observed in this Region. This was shown by one study to be a result of an unfortunate social change, i.e. abandonment of breast-feeding by large numbers of women in the lower socio-economic group.

2.4 Enterotoxigenic Escherichia (ETEC)

Although the role of ETEC as diarrhoeal pathogens in our Region is unknown, they feature prominently as a cause of diarrhoea elsewhere in Asia, and cause diarrhoea among tourists from industrialized countries who travel in developing countries.

Other pathogens shown to be important diarrhoea pathogens in other regions are V. parahaemolyticus, Campylobacter jejuni and Yersinia enterocolitica. Whether these organisms are important in our Region needs to be determined.

2.5 Parvoviruses

These have been associated with explosive outbreaks in institutions and communities involving older children and adults. Their role in our Region is unknown.

3. Therapeutic implications

3.1 The enteric pathogens that cause diarrhoea do so by the following mechanisms alone or in combination:

(a) enterotoxin production; and
(b) invasion of tissue.

3.2 In the presence of glucose or sucrose, the intestinal mucosa retain the capacity to absorb water and electrolytes during all acute watery diarrhoeas.

3.3 Most enteric infections in healthy infants and adults are self-limited, and need not be treated with antibiotics. Most cases are caused by infectious agents which do not respond to drug treatment. For a number of agents, the role of drug treatment is unproven and in some instances antimicrobials may actually be harmful. Antimicrobial

drugs should be reserved for cases of cholera and for cases presenting with blood and/or mucus in stools.

3.4 Antidiarrhoeal medications are expensive, may be harmful or of questionable value, and should not be used.

4. Mechanism of transmission

4.1 Little information is available concerning the precise means of transmission of enteric pathogens in diseases that occur in the Region. Two primary transmission mechanisms appear to be operative, i.e., contact, and common vehicle routes. Both means of transmission are especially important in the weaning period. There is abundant documentation of the protective role of breast-feeding against infantile diarrhoea.

5. Clinical implications

5.1 Immediate

Infants tolerate fluid and electrolyte imbalances poorly. The consequences of diarrhoea are far more serious in infants than in older children and adults; thus there is an urgent need for corrective treatment. Oral fluid rehydration, in the context of primary care, is the most practical approach for such treatment.

5.2 Short-term sequelae

In early childhood, the vicious cycle of diarrhoeal diseases and malnutrition has been clearly documented. Many young children suffer repeated attacks of acute diarrhoeas, superimposed on a chronic state of malnutrition, often resulting in death. Oral rehydration supported by early feeding during these episodes of acute diarrhoeas can correct dehydration and alleviate malnutrition.

5.3 Long-term implications

Burdened by repeated bouts of diarrhoea and accompanying malnutrition, children may reach school age with compromised constitutions, and reduced potential for education and preparation for adult citizenship. Social implications of these events are evident. It is clear that mothers are reluctant to accept family planning if the chances are small that a child will survive to fruitful adulthood.

6. The WHO Diarrhoeal Diseases Control Programme

6.1 It has been well documented that, except in extreme cases, dehydration in all diarrhoeal diseases, regardless of aetiology, can be safely and effectively treated and prevented at all ages simply by administering by mouth a single solution containing

glucose (or sucrose) and salts. This same solution, when combined with breast-feeding, contributes to better weight gain in infancy, and thus reduces the ill effects of diarrhoea on nutritional status. Thus, oral fluid rehydration, if adopted in the context of primary health care, as is being advocated by the WHO Diarrhoeal Diseases Control Programme as the most appropriate strategy, can directly and immediately be used to prevent the awesome loss of life and the heavy burden of pathology caused, directly or indirectly, by the diarrhoeal diseases.

During the discussion, it was repeatedly emphasized that it is important to bear in mind that the root causes of faecal oral transmission are the inadequacies of water and facilities for excreta disposal. The correction of these root causes also deserves priority in the commitment of national resources.

Epidemiological features of diarrhoeal diseases in the Region were discussed, and were shown to cause a major proportion of paediatric hospital admissions and deaths, especially in the under-five age groups. Shigella, Salmonella and Enteropathogenic E. coli were the most commonly recognised enteric bacterial pathogens, but these accounted only for 10 - 20% of laboratory-investigated cases. Diarrhoeal diseases were associated largely with low socio-economic standards, poor environmental sanitation and artificial feeding.

The Group was of the opinion that epidemiological surveillance should be an integrated part of diarrhoeal disease programmes, as a means of defining the extent, the problems, high risk groups, seasonality and, as a preliminary step for future evaluation of the impact of the programme on morbidity and mortality from diarrhoeal diseases.

## VI REVIEW OF THE RESULTS OF RESEARCH, TRIALS AND EXPERIENCE WITH ORAL REHYDRATION IN ACUTE DIARRHOEAL DISEASE OF YOUNG CHILDREN IN THIS REGION AND ELSEWHERE

The demonstration, in the mid-1960s, that glucose-stimulated sodium transport was intact in cholera patients, provided the rational basis for developing a practical oral rehydration solution (ORS). Numerous studies have confirmed its efficacy in reducing intravenous fluid requirements in the correction of diarrhoeal dehydration. In conjunction with limited quantities of intravenous fluids to correct shock, oral maintenance therapy with the glucose electrolytes solution has been associated with less than 1% case-fatality rates, even among severely ill patients. Its use has been extended to adults and children with both cholera, and non-cholera, diarrhoeas. The World

Health Organization formula, containing (g./L):

| | |
|---|---|
| glucose | 20 g. |
| sodium chloride | 3.5 g. |
| potassium chloride | 1.5 g. |
| sodium bicarbonate | 2.5 g. |

has been found safe and effective in patients of all ages, and in all aetiological groups, for acute watery diarrhoea cases.

Recent research has focussed on use of ORS in infants, including neonates. Since these patients require relatively more free water than adults, it is recommended that they receive the oral solution, followed by extra free water, in the ratio of 2:1. Milk should not be given until rehydration is complete (usually 6-12 hours after initiating therapy). Infants with moderately severe dehydration, particularly those under 6 months old, should receive 8 oz. (240 ml.) of fluid therapy, hourly for 6-8 hours consisting of two parts (480 ml.) of ORS, followed by one part (240 ml.) of plain water. This procedure is preferable to adding the extra water directly to the ORS, because diluted solutions are less efficiently absorbed.

More than 95% of 300 infants with 5-10% dehydration, including neonates, have been successfully treated with ORS by mouth, without need for nasogastric tubes.

Infants with rotavirus, or bacterial, diarrhoeas respond equally well, as do both eutrophic and malnourished infants. Sucrose can substitute for glucose if there is no glucose available, but it is, however, associated with more vomiting, and more failure in severe cases. Comparison of ORS containing 60 vs. 90 mEq/L sodium revealed no distinct advantage over the more dilute solution; in fact, it caused more hyponatraemia than the WHO ORS formula. Comparison of 20 vs. 35 mEq/L of potassium in ORS for infants revealed superior net potassium absorption at the higher potassium concentration, and elimination of convalescent (asymptomatic) hypokalaemia.

Studies based at treatment centres have shown that acute episodes can be used to teach mothers about ORS, so that they can help treat their sick children. Maintenance with ORS at home, after initiating oral rehydration at the treatment centre, has reduced the mean duration of hospital stay and was found to be effective and safe when mothers received adequate instructions.

Field studies have shown reductions of 29% in referrals, and 50% in dehydration deaths, when oral therapy packets were distributed in villages with instructions and intensive promotional activities. This illustrates the need for adequate referral

back-up facilities, with intravenous fluids for severe cases, to best eliminate all preventable deaths. Reduced referrals need to be scrutinized to differentiate between, on the one hand, prevention of dehydration in severe cases and, on the other, mere reduction in unnecessary hospitalizations of mild cases.

Field studies have also indicated a marked nutritional benefit from oral rehydration, coupled with early resumption of oral feedings during diarrhoea, and avoidance of fasting.

Recommendations regarding current research subjects must await the outcome of rigorously controlled trials. These include consideration of the pros and cons of unsupervised home use of ORS; the value of measuring spoons or "pinch and scoop" measurements, the use of incomplete sugar-salt formulas, lacking adequate potassium and bicarbonate, etc.

In general, the use of antibiotics to treat acute watery diarrhoea is to be condemned, except in cases of suspected cholera or severe bloody dysentery. Use of antibiotics in salmonellosis prolongs the carrier state; neomycin has no clear indication and causes severe malabsorption in diarrhoea; rotavirus does not respond to antibiotics. No firm evidence exists that other antidiarrhoeal agents have any value in diarrhoea management.

Future research should determine, in a controlled manner, the possible value of adding glycine to the ORS and the extent of prevention of severe dehydration, when ORS is begun early, in the home. In addition, the optimal post-diarrhoeal nutritional rehabilitation regimen needs to be defined.

## 1. Discussion

Among the questions addressed in the discussion period, the following salient points should be noted:

1.1 Concern about potability of water for ORS is not justified, because individuals drinking non-potable water all the time are exposed to negligible additional risk if they drink the same water in ORS during 8-24 hours of therapy. Whenever possible, water of doubtful potability should be boiled before adding ORS powder, and non-refrigerated ORS solutions prepared with water of doubtful quality should not be used for more than 24 hours. Programmes to improve water and service level should be promoted.

1.2 Vomiting is not an obstacle to successful oral therapy; infants who vomit more than four times may need I.V. therapy, but constitute only 2-4% of all such patients treated with ORS. Vomiting should be minimized by using warmed ORS solution, avoiding ingestion of more than 4 oz. of ORS in any 20 minute period, pausing 10-15 minutes if stomach appears distended, and waiting 10-15 minutes before resuming oral rehydration if vomiting does occur. Therapy must be vigorous, until signs of dehydration (sunken eyes, decreased urine output and reduced skin elasticity) are gone, after which breast-feeding or dilute milk formula should be immediately resumed.

88% of the children in some series vomited before admission; 63% vomited, at least once, during oral therapy, but the average of only two episodes of vomiting, and the low total volume of vomitus (average total 225 ml.) indicate the importance and benefit of continuing ORS, unless the patient vomits more than four times within a few hours.

ORS has completely replaced intraperitoneal infusion, which is not effective in severely dehydrated cases. In resuscitation of terminal dehydrated cases, femoral vein infusion should replace I.V. cut-downs in treatment centres where facilities exist.

Results of ORS experience in Iran, Egypt, Sudan and Pakistan were presented and discussed. These confirm studies in other areas and indicate acceptability and efficacy. In the Azerbaijan study and the Egyptian study, children given ORS gained nearly 400 gs. more than the control group, within six months. In Pakistan, ORS experience indicated reduced mortality, reduced hospital stay, and low costs.

## VII NATIONAL PROGRAMMES FOR DIARRHOEAL DISEASE CONTROL (DDC), PARTICULARLY IN THE CHILD UNDER THREE YEARS OF AGE

Acute diarrhoeal diseases have long been recognized as a major public health problem in developing countries, but appropriate inexpensive technology to reduce their ill effects only recently became available. Recent technological advances in this field have now been recognized by national health administrators, who are ready to make commitments to DDC. WHO has, therefore, initiated a high priority DDC programme of technical cooperation with Member States.

National DDC programmes have the short-term objective of reducing diarrhoea-related mortality and malnutrition in children by (1) promoting oral rehydration therapy and improved child care practices as an essential element of primary health care, and (2) by developing new tools and techniques for control through promotion and coordination of

research. The long-term objective should be to reduce the incidence of acute diarrhoeal diseases so that they no longer constitute a public health problem. This can be done by improving child care practice, by provision and utilization of essential facilities for water supply and sanitation, and by including health education and epidemiological surveillance as integral parts of programme strategy. The programme should also include epidemic control and treatment of acute diarrhoea in adults, particularly travellers' diarrhoea.

The programme should consist of two major components - implementation and research - each of which should include a training component for national manpower development.

1. Implementation

National DDC programmes should be developed, with a focus on rural and peri-urban areas, as a part of the country health programmes in the context of primary health care, and not as a vertical programme. Designation of a national coordinator with the necessary competence, motivation and influence to ensure implementation, including training and evaluation of the programme, may be the single most important factor for the success of a national programme. Creation of a multi-ministerial advisory body for collaboration with other fields has also been found to be very helpful. Unless active national commitment and participation is secured, including that of the communities involved, no long-term impact can be expected.

The following control strategies have been identified:

(a) Oral rehydration therapy, with appropriate dietetic management;

(b) Improvement of child care practices;

(c) Proper acceptance, provision, maintenance and utilization of sanitation, and water supply, facilities;

(d) Health education, and

(e) Epidemiological surveillance, including epidemic control.

Of these, oral rehydration therapy (rehydration plus dietetic education) is the most appropriate strategy, because of its practicability and immediate availability to the underserved population in rural and peri-urban areas. Many countries are using oral rehydration at present, but may not be deriving the expected benefit, as there is often no proper training of health personnel to guide the mothers, no supervision, no

evaluation and no coordination at the national level to assure continuity of supplies. This underlines the need for development of a National Programme Strategy, based on analysis of current activities and existing resources. Programme development may have to pass through several stages as shown in the table which follows:

1.1 Table I

Suggested major steps in the development of National DDC programme:

1.1.1 Initiation of the programme

a. Situation analysis - magnitude of the problem caused by diarrhoeal diseases and actions taken.

b. Commitment to DDC as part of country health programme in the context of primary health care.

c. Designation of a national coordinator for DDC.

d. Inter-Ministerial group created for coordination.

1.1.2 Planning of the programme

a. Determination of objectives and of operational targets.

b. Specification of strategies to achieve objectives and targets.

c. Determination of administrative channels to implement programme.

d. Planning of activities to implement strategies.

e. Estimation of resources required (manpower and materials), after re-allocation of existing resources.

1.1.3 Obtaining resources

a. Identification and training of management personnel.

b. Production of promotional and educational materials.

c. Development of facilities to produce ORS packages, or to obtain them on a regular basis, and to distribute them.

d. Acquisition of other resources as required.

e. Integration of the programme with other country health activities

f. Planning of coordination with international agencies.

1.1.4 Implementation and evaluation

a. Training of health personnel at different levels: in hospitals, universities, health centres, village health workers.

b. Promotion of community education.

c. Ensuring a continuous supply of ORS packages up to VHW level. Encouraging other channels of distribution, including commercial routes, as appropriate, to reach remote communities.

d. Incorporation of operational and impact evaluation in the programme.

e. Modification of the programme as indicated by evaluation data.

2. Research

Despite considerable technological advances in this field in recent years, there is urgent need for continuing research in order to develop new and improved tools for making a real impact in controlling these diseases. The global and regional advisory committees on medical research have established sub-committees on the global level, and study groups at the regional level, to coordinate the WHO programme of research. At the global level, the Technical Advisory Group (TAG) will be responsible for overviewing, guiding and evaluating the whole programme. Five Scientific Working Groups (SWGs) have been created to review current knowledge, identify gaps in knowledge and recommend priority areas of research in the goal-oriented research programme. SWGs on Immunity and Vaccine Development, Clinical Management (including drug development) and Child Care Practices Related to Diarrhoea, have already met and made their reports available. The SWGs on Aetiology and Epidemiology will have 5 sub-groups; those on *E. coli* Diarrhoea and on Viral Diarrhoea have completed their reports. The sub-groups on Cholera and Other Vibrio Infections, on Diarrhoeas due to Other Bacterial Pathogens and on Parasite-Related Diarrhoea, will meet during 1979 and early 1980, after which the SWG on Aetiology and Epidemiology will meet. Several Steering Committees will be established to manage the research activities in particular areas.

The Regional multi-disciplinary groups will similarly review regional situations, using the reports of the global SWGs as background documents, and will decide on regional priorities in research areas; they will also identify research workers and the institutions in their Region best qualified to undertake specific research projects. Special emphasis will be given to strengthening research capabilities by developing collaborative research between institutions in the developing and developed countries.

Though the precise mechanism for the management of the research programme is yet to evolve, it is certain that it will not be run by the WHO Secretariat, but by the research workers themselves, through the Technical Advisory Group, Scientific and Regional Working Groups and Steering Committees.

3. WHO-UNICEF inputs

As promoters and partners in this programme of technical cooperation, WHO and UNICEF are willing to provide critical inputs in national DDC programme development, particularly in programme formulation, training of national trainers and education of the community; cooperation will also include development of teaching and learning aids, procurement and production of essential supplies for oral rehydration and programme evaluation. In our Region alone, UNICEF is already helping four governments to establish local production facilities to produce ORS packets. WHO is preparing guidelines on national programme development, and manuals for clinical and management preparation of ORS packets, epidemiological surveillance, epidemic control and simplified laboratory techniques, and is developing a mechanism for rapid dissemination of technical information.

During discussion of national programme development within the Region, it was noted that several countries have made significant progress. Egypt has organized training courses for doctors and nurses, and has delivered (through primary health care centres) ORS sachets obtained from UNICEF. Presently, local ORS packet production is being organized in collaboration with UNICEF. The programme includes use of mass media, education on nutrition, hygiene and other aspects of public health, and on evaluation.

Syria has established local production of ORS packets with international collaboration. The packets will be sold at nominal cost. Afghanistan has organized a training centre emphasizing epidemiological services and oral rehydration, health education and improved feeding practices. Iran is planning to extend ORS use through the rural health centres. Two centres in Pakistan have extensively used ORS since 1977. Local ORS production is planned, in collaboration with UNICEF. Over 300 doctors have attended WHO-sponsored seminars. A national DDC Committee, including paediatricians and administrators and headed by a national coordinator, has been formed. The Pakistan Paediatric Association is actively supporting the programme by promoting health education, using mass media, and use of oral rehydration.

## VIII TRAINING AND REORIENTATION NEEDS IN THE COUNTRIES OF THE REGION AT ALL LEVELS

### 1. The role of information

The dissemination of information should be based on evaluation and selection of relevant and useful data. Useful knowledge should be further categorized for either educational or implementational use. Educational information should be processed to suit users and disseminated to teaching professionals who may or may not be attached to institutions. Such dissemination is important, even for countries not yet prepared to implement the programme on a national scale, and should be on a continuous basis. A mechanism for feedback of information from users should be developed to enhance the usefulness of the information system.

For implementation in a national health service network, available knowledge should also be evaluated, rearranged and processed to suit users. The users or final recipients should include all planners participating in national programme implementation. Information recipients should help to design and improve the information dissemination system.

### 2. Factors to be considered in development of national training programmes

To estimate requirements for manpower, materials and other resources, and to design an efficient sachet distribution system, the size, density and rural-urban distribution of the target population, particularly those at greatest risk, should be determined. The number of children under five years of age, the number of attacks of diarrhoea per child per year and the data on annual variations in diarrhoea incidence must all be known in order to calculate the required numbers of ORS sachets.

It is important to realise that while accessibility can be ensured, to a certain extent, by the planners, acceptability and contact with health service facilities are far more influenced by socio-economic and cultural variables and are therefore more difficult to quantify for planning purposes. Finally, treatment must be delivered and carried out in the most effective manner, and parents obtaining ORS must know how to use it. Deficiencies in any of the above factors will increase the likelihood of programme failure. The training strategy for programme implementation must be directed at avoiding these risk factors. It is, therefore, necessary to incorporate evaluation strategy into training activities at the stage of programme formulation.

The training components for national health workers at different levels, and the extension of training to non-medical workers, such as teachers and students, etc., were discussed. The need to orient training towards the problems of under-utilized services in some areas and, also, the need to reach under-served or inaccessible groups in the population were emphasized. Training should focus on the need to ensure delivery of effective treatment to the highest risk group, in order to derive maximum benefit from limited resources, particularly when countries may have to become self-reliant.

It must be recognized that many mild diarrhoeal episodes can be managed at home with continuation of breast-feeding, and augmented intake of fluids available at home, and may not need ORS packages. However, specific recommendations concerning special home-made salt-sugar solutions should await results of careful field evaluation. Programme implementation should include community education, including instructions to mothers in recognising when ORS is needed.

Training of health workers should take into account the factors affecting programme performance, including competing therapeutic systems, ability of population to comprehend the programme's value, and other factors constituting active resistance to the programme.

The Group was informed that WHO is in the process of producing the following training materials, most of which will probably appear by June 1980:

1. Manual on country DDC programme formulation;
2. Guidelines on prevention and treatment of acute diarrhoeal diseases for public health workers;
3. Manual on treatment of acute diarrhoeal diseases for physicians;
4. Diarrhoeal diseases compendium;
5. Manual of simplified procedures for isolation and identification of gut pathogens in peripheral laboratories with limited facilities;
6. Guidelines for production of ORS packages;
7. Guidelines for epidemiological investigations of diarrhoeal diseases;
8. Guidelines on epidemic control;
9. Guidelines on simple measures of water purification and sanitation;
10. Training course on management of DDC programme activities;

11. Annotated references on epidemiology and clinical aspects of diarrhoeal diseases;

12. Newsletter.

The participants emphasized the need for more effective promotional campaigns.

## IX UNICEF COLLABORATION

The Group was informed by participants representing UNICEF that:

(a) UNICEF is collaborating very closely with WHO in supporting national programmes, as was described in the Annex of the WHO DDC document 78.1.

(b) It was strongly emphasized that national requirements for ORS packets can best be met when requests are received at least 8 - 10 months in advance of expected needs. While limited stocks are available for emergencies, it was considered advisable for each country to anticipate its future needs and to develop a system of obtaining, storing, inventorying and distribution of ORS packets (including maintaining reserves for emergencies) on a continuing basis.

(c) The need for containers of known volume for preparation of ORS was expressed, but UNICEF felt that identification of locally suitable containers was preferable.

(d) UNICEF restated their willingmess to assist governments in the establishment of local facilities for the production of ORS packets.

(e) It was noted that various constraints, including possible exhaustion of available budgeted resources allocated for individual countries, might force reconsideration of funding mechanisms.

(f) UNICEF also expressed support for the development of promotional and teaching material, in technical collaboration with WHO at the national and global levels.

## X RECOMMENDATIONS AND PLAN OF ACTION

### 1. National programmes

1.1 Every country in the Region, which has not already done so, is invited to take a specific decision to use Oral Rehydration Salts for diarrhoeal disease of infants and young children at all health facilities, from the central hospitals to the most peripheral primary health care units. (Countries already committed include Afghanistan, Egypt, Iran, Kuwait, Pakistan, Sudan and Syria; in addition, UNRWA has adopted a similar policy for the areas it serves. The target date for remaining countries is the end of 1980.)

1.2 It is essential that a national programme be formulated in each country, with a detailed plan of action, to implement the above decision and to intensify efforts to reduce the incidence of diarrhoeal disease especially among young children (target date: 15 countries at least, end of 1982) and that a national programme coordinator for the diarrhoeal disease control programme be designated (target date: end of 1980).

### 2. Training

2.1 Training centres in the Region should be selected and designated specifically to train, in the correct use of oral rehydration, those who will train others.

2.1.1 Specific criteria for such centres should include the following:

(a) A specific ward, or emergency room space, and cribs for an oral rehydration unit;

(b) Assignment of appropriate supervisors, doctors, nurses and paramedicals to the unit as needed;

(c) Obtaining of basic material and supplies for therapy, including sachets, bottles or cups, spoons, graduated cylinders, plastic gallon storage jugs with lids, bottle warmer

(d) Location of training centres in treatment facilities which admit daily 3 or more children with 5-10% dehydration and which are open on a 24 hr. per day, 3 shift basis

(e) Instruction and supervision in the direct management of between 20 and 30 dehydrated patients should be given to trainees to ensure confidence and complete familiarity with a range of different cases and complications.

11. Annotated references on epidemiology and clinical aspects of diarrhoeal diseases;

12. Newsletter.

The participants emphasized the need for more effective promotional campaigns.

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(b) It was strongly emphasized that national requirements for ORS packets can best be met when requests are received at least 8 - 10 months in advance of expected needs. While limited stocks are available for emergencies, it was considered advisable for each country to anticipate its future needs and to develop a system of obtaining, storing, inventorying and distribution of ORS packets (including maintaining reserves for emergencies) on a continuing basis.

(c) The need for containers of known volume for preparation of ORS was expressed, but UNICEF felt that identification of locally suitable containers was preferable.

(d) UNICEF restated their willingness to assist governments in the establishment of local facilities for the production of ORS packets.

(e) It was noted that various constraints, including possible exhaustion of available budgeted resources allocated for individual countries, might force reconsideration of funding mechanisms.

(f) UNICEF also expressed support for the development of promotional and teaching material, in technical collaboration with WHO at the national and global levels.

## X RECOMMENDATIONS AND PLAN OF ACTION

### 1. National programmes

1.1 Every country in the Region, which has not already done so, is invited to take a specific decision to use Oral Rehydration Salts for diarrhoeal disease of infants and young children at all health facilities, from the central hospitals to the most peripheral primary health care units. (Countries already committed include Afghanistan, Egypt, Iran, Kuwait, Pakistan, Sudan and Syria; in addition, UNRWA has adopted a similar policy for the areas it serves. The target date for remaining countries is the end of 1980.)

1.2 It is essential that a national programme be formulated in each country, with a detailed plan of action, to implement the above decision and to intensify efforts to reduce the incidence of diarrhoeal disease especially among young children (target date: 15 countries at least, end of 1982) and that a national programme coordinator for the diarrhoeal disease control programme be designated (target date: end of 1980).

### 2. Training

2.1 Training centres in the Region should be selected and designated specifically to train, in the correct use of oral rehydration, those who will train others.

2.1.1 Specific criteria for such centres should include the following:

(a) A specific ward, or emergency room space, and cribs for an oral rehydration unit;

(b) Assignment of appropriate supervisors, doctors, nurses and paramedicals to the unit as needed;

(c) Obtaining of basic material and supplies for therapy, including sachets, bottles or cups, spoons, graduated cylinders, plastic gallon storage jugs with lids, bottle warmer

(d) Location of training centres in treatment facilities which admit daily 3 or more children with 5-10% dehydration and which are open on a 24 hr. per day, 3 shift basis

(e) Instruction and supervision in the direct management of between 20 and 30 dehydrated patients should be given to trainees to ensure confidence and complete familiarity with a range of different cases and complications.

2.1.2 A special standard "package" of teaching aids should be made available to each centre, including key slides, reprints, reports, etc.

2.1.3 Centres should be capable of training up to ten trainees at a time, who will work 8-hour shifts. Facilities for lodging trainees during training will thus be needed.

2.1.4 Training centres must permit, encourage and facilitate stays by mothers, in order to teach them oral therapy, to demonstrate nutritional and diarrhoea prevention methods to them and to enlist their help in treating their children.

2.1.5 The training at these centres must include simple epidemiological surveillance methodology to identify community areas of high diarrhoeal disease morbidity and mortality. (Target dates: Designate two centres, meeting the above criteria, by mid-1980; send at least ten trainees before end of 1980. Designate at least four centres by end of 1982. The following centres will be taken into consideration: Dow Medical College, Karachi; Children's Emergency Hospital, Khartoum; Mayo Hospital, Lahore; a major paediatric hospital, Cairo; Shewaki Health Centre, Kabul.

2.2 Special training in other particular fields, or techniques, in appropriate institutions, and based on programme needs, should be facilitated by means of fellowships and study tours.

2.3 Two- or three-day travelling seminars for each selected country on diarrhoeal therapy, breast feeding and other important child health topics, should be organized, according to the countries' requirements, so as to reach as many paediatricians, and other field workers, as possible. (Target dates: West bank and Gaza, 1979; Syria - Damascus, Aleppo, Latakkia - 1980; Tunisia - Tunis, Sfax, Sousse - 1980; and at least three such seminars in other selected countries per annum.)

2.4 One or two inter-country seminars of a suitable scientific level on acute diarrhoeal disease should be organized for paediatricians and other physicians in countries which have not yet had the opportunity to gain experience with oral rehydration therapy. (One in 1980; if required, another in 1981 or 1982).

3. Dissemination of Information

3.1 Current information should be made readily available by WHO to national programme participants, paediatric societies, medical colleges, and other interested parties. This information should include key references and (when appropriate) reprints, Medlar searches and/or annotated bibliographies, and updated teaching materials. A newsletter containing current programme information should be developed.

3.2 Particular attention is required to encourage incorporation of new information into medical college and paramedical training curricula.

3.3 WHO/EMRO and UNICEF are requested to make available, in Arabic, Somali and Urdu, training materials and guidelines aimed at the primary health care worker.

(Target dates: Depending on the availability of some of the materials currently under preparation, packages in the form of lecture notes should be distributed to at least 100 relevant institutions by the end of 1980; and substantial distribution of PHC worker material should be made by the end of 1980).

4. Research and epidemiological studies

The following recommendations are made in order of priority:

4.1 The development of protocols for operational and epidemiological research related to diarrhoeal disease and oral rehydration should be given high priority: this particularly applies to studies tending to identify and validate recognition of groups at relatively high risk of morbidity and mortality from diarrhoeal disease, and to focus programme inputs on these groups, as well as studies which clarify the factors associated with the highest incidence of malnutrition and the highest case-fatality from diarrhoeal disease.

(Target date: Initiate at least three such studies by mid-1981).

4.2 Studies are needed to compare different means of delivery of ORS, i.e. packets vs. spoons vs. pinch and scoop methods of mixing. These studies should include comparison of adequacy of potassium and bicarbonate replacement, as well as water and salt absorption, using the different methods. Safety of mixing and dilution of ingredients, and cumulative effects of multiple use of particular regimens in recurrent diarrhoeal attacks, need to be compared. The mechanism of the effect of oral rehydration on

nutritional status should be investigated, with particular attention to the possible importance of potassium replacement, resulting in improved appetite,

(Target dates: Initiate such research studies by the mid-1980s).

4.3 The collaborative programme of WHO and UNICEF with the countries should give high priority to the studies defining the most effective methods of nutritional rehabilitation (usually fast post-diarrhoeal rehabilitation) in each national or local context.

4.4 Research aimed at evaluation of training methods and materials should be carried out to determine optimal approaches to ensure effective training of trainees and of other personnel.

4.5 The problem of recurrent and intractable diarrhoea should be studied in order to better define the causes.

4.6 Evaluation studies are to be encouraged of the usefulness or otherwise of anti-emetics, anti-diarrhoeal mixtures and antibiotics, on which a considerable amount may be spent in national health budgets.

4.7 It is recommended that a regional reference centre be identified, at which current techniques of identifying diarrhoea-causing agents can be used. These techniques should include, among others, the ELISA test for rotavirus, ELISA or Y-1 adrenal cell test for E. coli LT toxin, and suckling mouse test for ST. The centre should be capable of identifying pathogens in stool samples sent by regional treatment centres and other institutions. The main objective will be to identify aetiology in a statistically designed sample of area patients with appropriate controls. Such aetiological investigation should be carried out only in conjunction with mutually approved operational research protocols.

(Voluntary funds need to be sought for this purpose. It is recognised that it may take some years to develop an existing laboratory to the level where it can cope efficiently with substantial referred work).

N.B. Breast-feeding, which all members of the Scientific Working Group felt was one important aspect of diarrhoeal disease prevention, is not mentioned in these recommendations, mainly because it is understood that its training, research and dissemination of information needs will be the subject of a WHO/UNICEF effort parallel to this programme, but linked with it. It is recommended that a similar Scientific Working Group Meeting on Breast-Feeding be held (Target Date: before mid-1980).

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ANNEX I

OPENING ADDRESS

by

H.E. The Minister of Health, Mr A.R. Rawabdeh

Honorable Guests, Ladies and Gentlemen, Dear Colleagues,

First of all, I would like to welcome the Regional Scientific Group Meeting on Diarrhoeal Disease Control here in Amman, which is being held under the auspices of the World Health Organization. It is indeed a great pleasure for me to welcome every one of you to this meeting. I would like to congratulate Dr Taba, the Regional Director, for having chosen this location and also for his choice of participants, selected because of their technical expertise, who will certainly make valuable contributions to the success of the meeting.

I understand that, during this Scientific Group Meeting, the emphasis will not be so much on diarrhoeal diseases affecting all ages, as on the much larger problem (in terms of total mortality) of acute diarrhoeal diseases of infancy and early childhood. With 52% of its population under the age of 15, Jordan is certainly very much interested in, and affected by, the outcome of such a meeting.

As a token of our deep concern for the health and well-being of our "most cherished treasure", our children, we inaugurated, a few weeks ago, our National Immunization Programme, under the patronage of H.M. Queen Noor. Today, only 25-30 % of our children are immunized against the six major killers. We hope to reach the target of 80% by the end of this year. We now have 51 Maternal and Child Health Centres throughout the country. By the end of 1979, we will, God willing, reach this year's target of 60 centres. Our Health and Nutritional Education Programmes will need some revision; but we are quite seriously involved in promoting all the relevant activities, using every possible channel to get the message through. This is already an integral part of our Maternal and Child Health and School Health Programmes, in addition to mass media.

From the environmental aspect, our major problem is water. In terms of quality and quantity, water supply is not what we would have hoped for. But every effort is being expended for the effective control of the sanitary aspects of water for human consumption, and a proper balance between household and agricultural needs.

We are also aware of the importance of epidemiological surveillance, which is routinely carried out as part of our preventive medical activities, with appropriate coordination with our Division of Statistics and the Public Health Laboratory. But the need is now felt for an organized entity to carry out the necessary studies and possibly research. 1980 is earmarked to start such a programme, within the WHO Collaborative Programme in Jordan.

It is appropriate to mention here that this Ministry, being aware of the unique advantages of breast-feeding, is now in the process of tackling means of promoting it. This has already started as a health and nutrition education programme, which I mentioned earlier. We will soon convey this important message to those who do not attend the Maternal and Child Health Centres of this Ministry. We will stress the many advantages of this forgotten practice.

In conclusion, I would like to welcome you all once again and to tell you that the staff of our Health Ministry will gladly cooperate with you, and be ready to give you any assistance you may need. I would like to take this opportunity to thank you all for your participation, and wish you success in your forthcoming discussions, hoping that this gathering will have a deep impact on the development of Diarrhoeal Diseases Control.

God bless you all.

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God bless you all.

ANNEX II

MESSAGE FROM DR A.H. TABA
DIRECTOR
WHO EASTERN MEDITERRANEAN REGION
to the

SCIENTIFIC WORKING GROUP MEETING ON
DIARRHOEAL DISEASE CONTROL
Amman, 11 - 14 June 1979

Your Excellency, Mr Chairman, Ladies and Gentlemen,

On behalf of the World Health Organization I would like to thank the Government of Jordan and Your Excellency for hosting this meeting, and the National Preparatory Committee and its Chairman for all their work in its preparation. I would also like to thank the experts from the other countries in the Region, and from UNICEF and UNRWA, for their goodwill shown in coming to Amman to join together to help to fulfil the objectives of this meeting. As you may see from the list of participants, there are assembled here a number of experts from countries who have a very considerable knowledge and experience with the subject of the meeting.

WHO has, ever since its inception, been working together with its Member States in diarrhoeal disease control. For example, WHO has long collaborated with the countries in the development of laboratory facilities, which play a crucial role in the investigation of diarrhoeal disease outbreaks; and in epidemiological studies, such as those made between 1960 and 1965 in Egypt, Iran, Pakistan and Sudan.

The new emphasis on acute diarrhoeal disease of infancy and early childhood is the result of the convergence of a number of originally separate developments, and it may be interesting to enumerate them. The results of studies on the physiology of sodium and other electrolyte and fluid absorption in cholera and the role of glucose in this, led to the development of an effective formula for oral rehydration. In trials in various countries, between 1971 - 1977, this was found equally effective in most cases of acute diarrhoea in infants and young children, regardless of the causative organism.

About 1974, WHO and UNICEF joined to promote and produce a single formula of oral rehydration salts. At the same time, as vital statistics gradually improve, it was more and more realised what an enormous number of children died from dehydration in acute diarrhoeal disease each year, three quarters of a million in our Region alone. Lastly, studies in Guatemala, together with the quite unexpected beneficial results of oral rehydration treatment on children's nutritional status for months afterwards, re-emphasized and highlighted the crucial causative role which diarrhoeal disease plays in protein-calorie malnutrition.

In relation to the WHO programme, these developments culminated in 1978 in the WHA Resolution 31.44 and the voluntary donations of the United Kingdom and other countries, which facilitated and formally established an expanded programme of Diarrhoeal Disease Control.

Last year, in Alexandria, we held a Regional Meeting on Cholera and Diarrhoeal Diseases. At that meeting, it was decided what type of activities WHO would undertake in this Region in the next five years, and a draft medium-term programme was discussed and accepted in principle. The meeting itself followed a global meeting in WHO Geneva in which an Advisory Group had discussed and made recommendations on the development of a programme for diarrhoeal disease control.

This meeting in Amman will focus particularly on the control of diarrhoeal disease in infants and young children and, moreover, will give special attention to the prevention or treatment of dehydration. We are concentrating our attention entirely on the greatest single cause of mortality in our Region, and the three quarters of a million children who die every year from dehydration in diarrhoeal disease, or from severe malnutrition to which diarrhoeal disease has contributed significantly.

The purposes of the meeting are to review with you the current technical knowledge on this subject, both concerning the effectiveness of methods of prevention and treatment, and also our knowledge of the epidemiological baseline. Where it is very important to identify and undertake studies to fill the gaps in our knowledge, we aim to come to decisions as to where, when, how and by whom this will be done. However, we certainly do not wish to wait until the results of a research programme are available. I believe you will decide that we know sufficient already to make a greatly expanded programme of diarrhoeal disease control imperative. That being so, we must identify

the needs for training, for information dissemination to health workers, for public information and the needs for advisory and planning services to the governments. Again, we hope that we will have your advice as to where, when, how and by whom these needs are to be met, and what role WHO and UNICEF should play in helping to meet them.

Certainly WHO, in this Region, has not been idle, since we held our Regional Meeting last year. Seminars were held in Lahore and Karachi on Diarrhoeal Disease and Rehydration in January, and were attended by over 150 doctors. The results of the studies of the effectiveness of oral rehydration salts at village level in Iran and Egypt were analysed, and the report on the study in Iran will be presented to you here. Preparations are being made to evaluate, in Gaza (whose population is almost half a million), the effect of use of oral rehydration salts on a massive scale in reducing mortality and hospital admissions from diarrhoeal disease, and in improving the nutritional status of the whole population under three years. Consultations have taken place with virtually every country in our Region on its medium-term programme in communicable disease control, and among the subjects raised was diarrhoeal disease control. Consultations on oral rehydration specifically have taken place with Afghanistan, Egypt, Pakistan, Sudan and Syria, and all those countries, with some UNICEF and WHO assistance, are going to produce and package ORS themselves, with a view to using it throughout the health services, with paramedical, as well as medical, personnel.

However, you will appreciate that this is only a beginning and that much more is required. To cooperate together, WHO, UNICEF and other UN agencies, with the governments and peoples of this Region, are taking advantage of new technical developments to intensify and make much more effective our efforts to prevent mortality and morbidity of young children from diarrhoeal disease; such cooperation must be one of the most worthwhile enterprises possible for us to undertake. It is very appropriate that we are undertaking it in the International Year of the Child. If this meeting can be made a crucial turning point in the reduction of this terrible burden on child health in this Region, then you will indeed have helped to fulfil an important aim of this year, namely, to initiate activity of lasting benefit for the welfare of children. In your serious, but inspiring, task, I wish you all success.

# ANNEX III

## LIST OF PARTICIPANTS

| | |
|---|---|
| AFGHANISTAN | Dr Khanmir Ghyoor<br>President<br>Preventive Medicine Department<br>Ministry of Public Health<br>Kabul |
| | Dr S. Sagar<br>Chief<br>Department of Epidemiology<br>Public Health Institute<br>Kabul |
| EGYPT | Dr Lotfi El Sayyad<br>Director-General<br>MCH General Administration<br>Ministry of Health<br>Cairo |
| | Dr Nabil Nassar<br>Director of Rural Health Centres Department<br>Ministry of Health<br>Cairo |
| IRAN | Dr Parviz Rezaie<br>Technical Deputy Director<br>Communicable Diseases and<br>Malaria Eradication Department<br>Teheran |
| | Dr Gholamreza Mirhosseini<br>Director Malaria Eradication and<br>Communicable Diseases Control<br>Province of Khorassan |
| IRAQ | Professor Adnan Shakir<br>Professor of Paediatrics<br>Baghdad University Medical College<br>Baghdad |
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List of Participants (continued)

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| JORDAN | Dr Mahdi Abul Dahab<br>Head, Paediatrics Division<br>Bashir Hospital<br>Ministry of Health<br>Amman |
| | Dr Saad Hijazi<br>Assistant Professor,<br>Nutrition and Child Health<br>Faculty of Medicine<br>Jordan University<br>Amman |
| PAKISTAN | Professor Shaukat Raza Khan<br>Paediatrician<br>King Edward Medical College<br>Lahore |
| | Professor Ghaffar Billoo<br>Professor of Paediatrics<br>Dow Medical College<br>Karachi |
| | Professor Razia Rehmatullah<br>Paediatrician<br>Institute of Paediatrics<br>Jinnah Post Graduate Medical Centre<br>Karachi |
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| | Dr Jaafar Sulieman<br>Paediatrician<br>Ministry of Health<br>Khartoum |
| SYRIA | Dr Yassin Muftah<br>Director of Preventive Health Services<br>Ministry of Health<br>Damascus |
| | Dr Khaled Mardini<br>Director of MCH<br>Ministry of Health<br>Damascus |

List of Participants (continued)

OBSERVERS FROM HOST COUNTRY:

Dr Suleiman Cobein
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REPRESENTATIVES FROM OTHER UNITED NATIONS BODIES

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Mr Abdullatif Succar
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Dr J. Sayegh
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REPRESENTATIVES FROM OTHER UNITED NATIONS BODIES (continued)

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|---|---|---|
| UNICEF | Dr Bijan Sharif-Vatani<br>Programme Officer<br>UNICEF<br>Islamabad<br>PAKISTAN | |
| | Mr Leo Devos<br>Programme Officer<br>UNICEF<br>Rabat<br>MOROCCO | |
| UNRWA | Dr L.M. Eriksson<br>WHO Medical Officer<br>Representative of UNRWA<br>Amman<br>JORDAN | |

WHO SECRETARIAT

| | | |
|---|---|---|
| Dr R. Cook | Regional Adviser<br>Maternal and Child Health<br>Secretary of the Meeting | WHO Regional Office<br>for the Eastern<br>Mediterranean<br>Alexandria, EGYPT |
| Dr D. Barua | Medical Officer<br>Bacterial and Venereal<br>Infections | WHO Central Office<br>Geneva, SWITZERLAND |
| Dr M.H. Wahdan | Regional Adviser<br>Epidemiological Surveillance<br>of Communicable Diseases | WHO Regional Office<br>for the Eastern<br>Mediterranean<br>Alexandria, EGYPT |
| Dr E.J. Gangarosa | WHO Consultant | Dean<br>Faculty of Health<br>Sciences<br>American University<br>of Beirut<br>LEBANON |

List of Participants (continued)

WHO SECRETARIAT (continued)

| | | |
|---|---|---|
| Dr D. Nalin | WHO Consultant | Chief<br>Physiology Section<br>Centre for Vaccine Development<br>University of Maryland<br>Baltimore, Maryland<br>USA |
| Dr Y. Watanabe | WHO Consultant | Adviser for Laboratories<br>Ministry of Public Health<br>Kuwait |
| Mrs C. Cartoudis-Démétrio | Conference Officer | WHO Regional Office for the Eastern Mediterranean<br>Alexandria, EGYPT |
| Mrs A. Attia | Secretary | WHO Regional Office for the Eastern Mediterranean<br>Alexandria, EGYPT |

RESOURCE STAFF

| | | |
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| Dr Shanti Ghosh | WHO Medical Officer | Family Health Services Development, Kabul<br>AFGHANISTAN |
| Dr P.M. Shah | WHO Medical Officer | Maternal, Child and Family Health, Mogadishu<br>SOMALIA |
| Dr A.A. Khan | WHO Medical Officer | Expanded Programme of Immunization, Damascus<br>SYRIA |

NATIONAL PREPARATORY COMMITTEE

| | | |
|---|---|---|
| Dr Mahdi Abul Dahab | Chairman | Head<br>Paediatrics Division<br>Bashir Hospital<br>Ministry of Health<br>Amman<br>JORDAN |