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**Programme for the Control of
Acute Respiratory Infections**

Report of the
eighth meeting of the

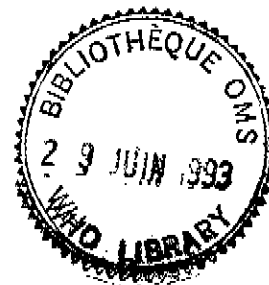
Technical Advisory Group

Geneva, 15-19 March 1993

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LIST OF PARTICIPANTS

MEMBERS

Dr K.B. Banerjee, Consultant, The World Bank, New Delhi, India

Dr P. Chaulet, Clinique de Pneumo-Physiologie Matiben, Centre Hospitalier
Universitaire d'Alger-Ouest, Algiers, Algeria

Associate Professor M.J. Hensley, Faculty of Medicine, University of Newcastle,
Newcastle, Australia

* Professor W.W. Holland, Department of Community Medicine, St. Thomas' Hospital,
London, United Kingdom

* Dr C. Lanata, Instituto de Investigacion Nutricional, Lima, Peru

Dr P.H. Mäkelä, Division of Infectious Diseases, National Public Health Institute,
Helsinki, Finland

Dr M.K. Mardini, Director of Maternal and Child Health, Ministry of Health,
Damascus, Syria

Professor A.S. Muller, Department of Social Medicine, Faculty of Medicine, University of
Amsterdam, Netherlands

Dr F.E. Onyango, Department of Paediatric and Child Health, University of Nairobi,
Nairobi, Kenya

Dr David Sencer, Management Sciences for Health, Newton, MA, USA

Dr Zhu Zonghan, Beijing Municipal Health Bureau, Beijing, People's Republic of China

SECRETARIAT

Dr R. Henderson, Assistant Director-General, Geneva

* Unable to attend

CDR/ARI Headquarters

Dr A. Cattaneo, Medical Officer, ARI, Geneva
Dr S. Gove, Research Coordinator, ARI, Geneva
Mr R. Hogan, Programme Management Officer, CDR, Geneva
Ms D. Klingler, Administrative Secretary, ARI, Geneva
Dr G. Pelto, Scientist, ARI, Geneva
Dr N. Pierce, Medical Officer, CDR, Geneva
Dr A. Pio, Programme Manager, ARI, Geneva
Dr D.A. Robinson, Medical Officer, ARI, Geneva
Dr J. Tulloch, Director, CDR, Geneva

Regional Offices

Dr A. Kabore, Regional Adviser/CDD, AFRO
Dr Y. Benguigui, Regional Adviser, AMRO
Dr M. Lichnevski, Regional Adviser, EMRO
Dr C. Roure, Regional Adviser, EURO
Dr V.J. Kumar, Regional Adviser, SEARO
Dr F. Bro, APO/WPRO

Other Programmes - Headquarters

Dr P.A. Phillips-Howard, Malaria Control
Dr P.M. Shah, Maternal and Child Health and Family Planning
Dr B. Underwood, Nutrition
Dr K. Weerasuriya, Action Programme on Essential Drugs

1. Introduction

The eighth meeting of the Technical Advisory Group (TAG) of the WHO Programme for the Control of Acute Respiratory Infections (ARI) was held in Geneva on 15-19 March 1993. In his opening statement, Dr R. H. Henderson, Assistant Director-General, stated that the TAG came at an important time for the Programme, given that the technical basis was firmly in place, that training materials were available for most national programme needs, and that the majority of tools for programme evaluation were also available. To help countries develop ARI control activities, the Programme had defined a list of priority countries where the size of the ARI-affected population made them feature prominently in the global figures for ARI mortality. One of the major pushes of the Programme over the previous biennium was the development of an integrated approach to management of the sick child in collaboration with other WHO Programmes and UNICEF. The Programme had brought to fruition the development of a focused ethnographic study protocol for use by national programmes, which was currently used as a practical tool by national programmes. The ARI Programme had undoubtedly made progress in many areas. Problems still remained however, and a major effort was needed to accelerate the implementation of the national control programmes.

Professor A.S. Muller chaired the meeting.

2. Status of the Programme

The TAG reviewed the progress made by the Programme in 1992, as described in detail in the Interim Programme Report for that year (document WHO/ARI/93.25), and noted the activities planned for 1993.

2.1 Global Programme

Of the estimated 12.9 million deaths among children under 5 years of age in the developing world in 1990, approximately one-third were caused by ARI, primarily pneumonia. Preventing deaths from pneumonia is therefore the main objective of the Programme; a reduction in child mortality has been reported in almost all areas in the developing world in recent years, and the ARI Programme can contribute to accelerating the decline. The key strategy for the ARI Programme is standard case management, by ensuring access to and use of diagnosis and treatment facilities, especially by children with the highest risk of pneumonia.

In 1992 the Programme continued disseminating the technical guidelines on case management: by the end of the year, 83 countries had adopted national guidelines. Another major step was the initiation of activity to integrate the ARI guidelines with

those of other WHO Programmes, involving close collaboration with UNICEF. Three charts for the integrated case management of the sick child were under development.

By the end of 1992, there were 67 operational national ARI programmes, 47 of them in the group of 88 countries with an infant mortality rate greater than 40 per 1000. It must be recognized, however, that in only a few of the 47 countries does the Programme cover more than a small percentage of the target population. Another concern is that progress in programme planning and implementation in the African Region is slower than elsewhere.

Training remains a major priority of the Programme, and the year saw the new four-day clinical course on outpatient care¹ introduced in various countries. In terms of the numbers of health workers receiving clinical training, information received by the Programme suggests that nearly 13 000 physicians and nearly 29 000 other health facility staff were trained in 1992. A special training package on treating children with a cough or difficult breathing was developed for community health workers.

Thirty-six new ARI training units were created in 1992, including the first ones in the European, South-East Asian and Western Pacific Regions, to bring the total to 88 units.

The availability and affordability of antibiotics, especially cotrimoxazole, is a primary concern for the Programme. The Programme is therefore exploring the possibility of making cotrimoxazole available in a special package that would improve prescription, management of limited stocks, and compliance; and to provide programme managers with a guide to describe the supply and cost of ARI drugs in their country.

Oxygen equipment is important to any ARI programme, and a significant development was made in 1992 with the design of a system for oxygen administration which can be used for both cylinders and oxygen concentrators. It can also be used to administer oxygen to up to four patients simultaneously.

Communication has always been stressed by the Programme. A useful tool developed by the Programme is a prototype home care card to remind health workers of the important points of home care advice. Workshops were held (and more are planned) to train social scientists in the use of the focused ethnographic study protocol. A guide on how to use the data produced by the ethnographic studies is in preparation.

Programme evaluation in 1992 concentrated on the field-testing of the two most important evaluation guides: the *Health facility survey manual* and the combined *CDD/ARI Household survey manual*. The former is intended to measure the quality of care at first-level health facilities, while the latter is used for seeking information on maternal knowledge of when to seek care and on care-seeking practices in the home. This is important as a large number of children with ARI who need assessment are not brought to health facilities.

¹ *Outpatient management of young children with ARI: A four-day clinical course*. WHO, 1992.

During 1992, 18 research projects were initiated, and a further 19 already in existence were given continued technical or financial support. All clinical studies are intended to gather information which can be used for refining current guidelines on case management. The largest clinical research project is a multicentre study on clinical signs and etiological agents of pneumonia, sepsis and meningitis in young infants. It was completed during the year in Gambia and will be completed in 1993 in Ethiopia, Papua New Guinea and the Philippines. A study of the pharmacokinetics of cotrimoxazole is planned for Viet Nam, and a study of the pharmacokinetics of chloramphenicol in severely malnourished children is already in progress in Gambia and Pakistan.

The behavioural research component comprises studies on the comparison of the results from a rapid focused ethnographic study with a longer-term prospective study; maternal understanding and interpretation of home care messages; and a comparison between study findings in an urban and a rural area.

The health systems research element focused on the field-testing of the manual for surveillance of bacterial drug resistance. The Programme continued to collaborate with other supporting agencies in the preparation of a trial of *H. influenzae* type b vaccine in Gambia. Activities were undertaken in relation to vitamin A supplementation and to indoor air pollution. Further details of these and other activities in relation to the prevention of ARI are covered in section 3 below.

2.2 Regional overviews

Africa

In most African countries the infant mortality rate is greater than 40 per 1000 live births. It is estimated that children under 5 years of age can experience between four and eight ARI episodes a year, and that there are 1.5 million deaths from ARI, mostly pneumonia, per year.

The ARI Programme started in Africa in 1987. Today 26 out of the 46 countries in the Region have drawn up operational plans: 17 of them have implemented their plans, but only seven have achieved national coverage.

During 1992, 22 health officers were trained in programme management skills; seven countries organized training in case management: 261 doctors, 1932 medical assistants and nurses, and 353 community-based health practitioners were trained. Three countries held a total of 14 training courses in their ARI Training Units (ATUs), training 232 health workers.

The major constraints of the programme in the Region are:

- lack of awareness by national health authorities of ARI and the options available for their control;
- poor acceptance by senior professionals of standard case management;
- lack of essential drugs;
- setting of unrealistic targets by countries during planning;
- excessive turnover of trained staff.

The priorities for the regional ARI Programme in the coming years are:

- at all levels, increased sensitization to, and information and communication on, the problem of ARI in children;
- intensified training activities, especially on case management;
- accelerated implementation of operational plans on ARI control;
- promotion of collaboration with national essential drugs programmes;
- encouragement of collaboration with NGOs and other agencies to support national programmes on ARI control.

Americas

Activities to control acute respiratory infections, which were begun in the early 1980s in some countries, have achieved a significant degree of consolidation in most countries. In the last two years in particular, there has been notable progress in the definition of control policies by governments, the preparation of plans of operation for the development of activities, the training of personnel at the central and regional levels, the execution of these plans, and the establishment of the system for training personnel at local level responsible for specific control activities.

By the end of 1992, all countries with an infant mortality rate higher than 40 per 1000 live births had a national plan of operation.

An effort was made to strengthen the coordination of ARI control activities with other maternal and child health activities. This effort was facilitated by the momentum generated by the 1990 World Summit for Children.

A regional seminar on priority evaluation studies for the control of ARI was held in Montevideo, Uruguay, with representatives from 11 countries. Workshops for evaluation of ARI control activities were held in Chile and Colombia. National courses on ARI programme management were attended by 214 participants from provincial level in eight countries.

There are 42 ATUs in 10 countries of the Region, of which 23 were established in 1992. These units trained 1874 physicians and nurses working in first-level health facilities.

A total of 101 800 copies of modules and other technical and educational documents from WHO on ARI control were distributed during 1992.

Despite the limitations that confront the ARI regional programme with regard to the magnitude of the task to be carried out and the availability of financial and human resources, significant progress has been achieved in increasing awareness of the problem in the Region:

- An ARI focal person at the central level has been designated within the ministry of health in all countries;
- All the countries of the Region have adopted the PAHO/WHO technical recommendations for ARI case management;
- Twenty countries have a "National Plan of Operation" for the development of ARI control;
- Twenty-two countries have established a national ARI programme profile;
- Twenty-two countries are using the PAHO/WHO training modules;
- Twenty-four countries have implemented ARI activities at first-level health facilities;
- Epidemiological information is available in all countries.

South-East Asia

The countries of the South-East Asian Region have the highest pneumonia-related mortality among children in the world. Eight countries have an infant mortality rate of 40 or more per 1000 live births and three countries are identified as priority countries for the control programme due to high absolute numbers of pneumonia deaths. The case fatality rate from pneumonia among hospitalized children varies between 4% and 18%.

National ARI control activities have been initiated in all countries but one in the region. Detailed plans of operations have been produced in eight countries and technical

guidelines prepared in consultation with professional staff. All countries implementing the Programme have appointed programme managers.

WHO training materials were used to start the training of doctors. The process of adaptation, translation, printing and distribution of the training materials was begun in all countries that have a programme. Locally developed materials are now utilized during training.

Training on standard case management was provided to 293 trainers, 1050 doctors working in hospitals, 6838 doctors working in health centres and 17 986 nurses or midwives. More than 2500 general practitioners took part in orientation seminars/panel discussions.

More than 30 000 community health volunteers in the Region are trained in standard case management. In most countries the health volunteers do not prescribe antibiotics for the treatment of pneumonia at home. Bhutan, Indonesia, Mongolia and Nepal have plans to train volunteers in selected areas to treat pneumonia. This would help to increase access to standard case management.

Cotrimoxazole was chosen as the first-line antibiotic for treatment of pneumonia at home in all the countries except Thailand. Supplies are channelled through essential drugs programmes wherever possible. Three member countries have a policy preventing the use of harmful cough and cold remedies. Oxygen concentrators were procured by Mongolia. Sounding timers will be made available in Indonesia and Nepal.

A health facility survey was carried out in two districts in India, and evaluated 452 children with ARI. The breathing rate was counted in more than 70% of cases. Antibiotics were prescribed in only 18% of children with AURI. Home-made cough remedies were used for treatment of cough. Teaching materials and antibiotic supplies were available in 90% of the health facilities surveyed.

The combined CDD/ARI household survey instrument was field-tested in Sri Lanka. It was possible to survey 356 caretakers of children with ARI needing assessment and 1735 children with cough during the preceding two weeks. At least 35% of caretakers were aware of at least one danger sign, i.e., fast breathing, difficult breathing or "pneumonia" (as defined in local terms). Harmful drugs were prescribed in only 16% of ARI cases.

A mortality survey was carried out in Bangladesh and Indonesia. Programme monitoring was systematically performed in 24 districts in India, with the emphasis on problem-solving; the quality of training was assessed in 48 out of 291 training courses.

WHO and UNICEF collaborate actively in the Member countries of the Region. International agencies and NGOs are supporting the Programme, with the technical support of WHO.

Europe

From 30 Member States in the European Region in 1991, in 1992 the number increased to 48. At present, there are 50 countries in Europe. This rapid change is associated with the political, economic and social instability in some areas of the Region.

Although ARI is one of the major causes of death among young children, it does not feature among the programme budget priorities at the WHO Regional office for Europe (although the situation has improved somewhat recently).

It is planned that prevention of deaths from pneumonia will be achieved through regional and country programmes in Albania, Romania, Turkey, the four Central Asian republics and Kazakhstan, with technical advice and support from WHO.

Turkey has the most advanced programme in the Region. Twenty-two provinces are currently covered by the Programme with a total under-five population of 1.2 million. The activities in the country were recently revised and a plan of action prepared.

A proposal for assistance in the ARI and CDD programmes in the newly independent states of Eastern Europe and Central Asia was submitted to several European governments and to the European Community.

With the support of UNICEF, WHO organized a coordination meeting in September 1992, in Minsk, Belarus, on the development of national programmes on EPI/CDD/ARI for the new independent states of the former Soviet Union.

The meeting proposed activities in strengthening CDD and ARI programmes in the four Central Asian republics and Kazakhstan. In most of the republics, emphasis needs to be placed on the development of appropriate policies and technical guidelines using standard WHO recommendations, and on the training of key people in programme and case management.

Eastern Mediterranean

Regional ARI activities in 1992 focused on supporting the development of national programmes, especially in the areas of planning and training.

By the end of 1992, 13 out of 22 Member States (including 11 out of 13 main target countries) of the Eastern Mediterranean Region had appointed national programme managers, developed national plans, and prepared or updated technical guidelines for ARI standard case management. In nine of these countries ARI activities were being implemented. In two other countries the Programme's operations were in the initial stages of implementation, while in one country they were suspended owing to civil unrest.

Training activities continued to receive high support. ARI clinical management courses were conducted in 10 countries, with the participation of about 12 000 doctors and nurses, and over 16 000 other health workers in charge of case management of ARI in children at first-level health facilities and at the community level. These activities included 122 ATU-based courses with 2134 participants. An intercountry ARI outpatient clinical management course was conducted at the new ARI Regional Training Centre in Islamabad, Pakistan, for 16 senior paediatricians from five countries.

In addition, orientation seminars and workshops for medical opinion leaders, paediatricians and other health professionals were conducted in several countries. One country organized several ARI programme management courses.

A focused ethnographic study (FES) was conducted in Kordofan State, Sudan, and the results were used to adapt communication messages and training materials. In Egypt, the results of the FES conducted in 1990 were used in 1992 to design face-to-face messages and posters.

Comprehensive reviews were conducted with WHO participation in three countries, and provided valuable insights into the problems experienced by the ARI programmes; substantive recommendations for improvement were made.

Western Pacific

A total of 15 countries in the Western Pacific Region have operational ARI programmes, including all countries with an infant mortality rate of over 40 per 1000. As the national programmes expand there is an increased need for strengthening the programme planning at provincial and district levels and for the development of practical programme management tools.

The overall training coverage in the Region now exceeds 20%. In 1992 the coverage increased most in the Philippines, where 50% of health workers at first-level health facilities are trained in standard case management. In Viet Nam the proportion is 39% and in China 20%. The rise in training coverage is expected to continue and reach national coverage in the Philippines within a few years. In Viet Nam the programme will focus more on certain high risk areas in the future. In China the target is 80% coverage by the end of 1995.

With the expansion of national programmes, the quality of training must be maintained. The new training material for outpatient case management and the training package for community health workers will be introduced through training of trainers courses.

Four health facility surveys were conducted in the Region. The surveys quantified problems which were already known, and exposed areas where problems had not been expected. Additionally, the surveys improved all the survey participants' ability to monitor

and supervise. Training of national survey coordinators will support future health facility surveys.

A standard format for patient registers and monitoring for inpatient and outpatient treatment of ARI has been introduced to ATUs. Supervision and monitoring after training in case management is important for ensuring the quality of case management. Based on what has been learned from the health facility surveyors, new tools for supervision using patient register reviews and new approaches to organizing supervision are now being developed.

In 1992 the first focused ethnographic study was conducted in Viet Nam. The information obtained was used to adapt communication material. A focused ethnographic study is planned for China in 1993.

A field-test of a combined ARI/CDD/breast-feeding household survey was conducted in the Philippines in 1992. Data are being analysed. Another household survey will be conducted in the Lao People's Democratic Republic in 1993.

Health facility surveys revealed that first-line antibiotics were not available in many health facilities. In the initial phase of implementation the national ARI programmes were able to supply newly trained staff with drugs to be used after training. As the programmes expand this will no longer be possible, and sustainable solutions will have to be found at the national level. This issue should be addressed specifically in the national plans of operation. To support this process close contact should be established between the national ARI programmes and programmes involved in drug procurement and distribution.

3. Programme activities in the prevention of pneumonia morbidity and mortality

Programme activities in prevention research have expanded greatly in the last two years, by involvement in vaccine research, by initiation of studies to explore reduction in indoor air pollution as an approach to reducing pneumonia incidence, and by an ongoing, thorough review of risk factors for childhood pneumonia and the potential impact of interventions to reduce these risk factors on morbidity and mortality.

The overall aim of the review process, which has been carried out in association with the Maternal and Child Epidemiology Unit (MCEU) of the London School of Hygiene and Tropical Medicine, has been to identify interventions to prevent pneumonia which are effective, feasible and affordable. Currently the ARI Programme advocates only one preventive strategy - the use of measles and pertussis vaccination.

An expert meeting was convened in March 1992² to review eight risk factors; a second meeting was held on 2-4 March 1993 to update the Programme on developments in the first round of reviews and to consider reviews of eleven additional risk factors which were commissioned following the 1992 meeting. Risk factors for pneumonia and their potential interventions have been grouped into several broad control strategies: immunization; nutrition; control of environmental pollution; reducing transmission of pathogens; case management or chemoprophylaxis; modification of social or behavioural risk factors.

The reviews assess the evidence for a causal relationship between risk factors and pneumonia and predict the reductions in pneumonia or ALRI mortality that might result from preventive interventions to reduce the risk factors. Risk factors (or their potential preventive interventions) were categorized into those of potentially high, medium, low or no impact and those which required further research before potential impact could be predicted. High impact was predicted for vaccines against pneumococcal pneumonia, measles, pertussis and RSV infections; medium impact for *H. influenzae* type b (Hib) vaccine, the promotion of breast-feeding and the reduction of low birth weight; low impact for reducing HIV transmission or by improving child spacing or maternal education; and no impact from vitamin A supplementation (other than measles-associated pneumonia in vitamin A deficient areas), antibiotic use in AURI, or by interventions to reduce helminth infection. Further research, review or analysis of existing data is required to estimate the impact of reducing protein-energy malnutrition, indoor air pollution, transmission of respiratory pathogens, chilling, environmental tobacco smoke, outdoor air pollution, or of eliminating deficiency of iron or other micronutrients.

A thorough meta-analysis and review of all available published and unpublished data on the relationship of vitamin A supplementation and childhood pneumonia was carried out in conjunction with the MCEU at the London School of Hygiene and Tropical Medicine. Given reports of increased ALRI morbidity after vitamin A supplementation in children under 6 months of age and the failure to demonstrate a beneficial impact on pneumonia mortality in field trials showing significant total and diarrhoea-specific mortality reduction, the pace of this review was accelerated because of concerns over the safety of a proposal to administer vitamin A supplementation with vaccination at 6, 10 and 14 weeks of age. Review of the sparse data available on infants under 6 months showed no reduction in total mortality in this age group (in contrast to the overall 30% reduction found in other age groups). There were inadequate data to establish the safety of supplementation in the first 5 months of life and inadequate data to estimate whether mortality will be reduced when the infant is 6-11 months old from such supplementation. As a result, the Programme advises against vitamin A supplementation in infants under 5 months of age (except for the treatment of measles or xerophthalmia) until research has established its safety. In areas where xerophthalmia is a public health problem, vitamin A supplementation in children over 5 months of age should lead to beneficial

² *Potential interventions for preventing pneumonia among young children.* Unpublished document: ARI/93.1.

reductions in total mortality, diarrhoea mortality and measles mortality (including measles-associated pneumonia). However, no beneficial impact on pneumonia incidence or non-measles-associated pneumonia mortality is expected.

The results of the prevention review suggest that at present, national ARI programmes should continue to focus their efforts on case management and the promotion of a high level of vaccination coverage against measles and pertussis. Further analysis, research and intervention development are needed before national ARI programmes adopt additional preventive interventions.

Prevention research within the ARI Programme gives highest priority to studies to determine the impact on pneumonia achievable through vaccination with Hib vaccine, pneumococcal conjugate vaccines, and the reduction of indoor air pollution. Once an RSV vaccine becomes available, the ARI Programme will promote its evaluation in developing countries.

Some progress in the prevention of pneumonia will be made during "sick child" clinic visits by the promotion of breast-feeding, improved weaning practices, increased convalescent feeding, improved vaccination coverage with EPI vaccines and, in areas where xerophthalmia is a public health problem, by updating vitamin A supplementation. Further research and development of the nutrition interventions within the sick child initiative will be shared by disease-control programmes collaborating in this effort (see section 5.1.2).

4. Financial matters

4.1 Revised programme budget for 1992-1993

The revised programme budget at US\$13.4 million is US\$ 1.7 million, or 14.4% greater than the previous version. The greatest increases are for the research component (24%) and regional activities (14%). The increases for research will cover studies on the relationship of vitamin A and pneumonia, vaccine field trials, and health systems research. In the Regions the greatest increase is for AFRO, where it is hoped that the availability of additional resources will stimulate greater activity in countries.

Financial contributions to the Programme have increased significantly since 1990-1991, and while there is a current shortfall of US\$ 2.2 million, it is expected that contributions in the remainder of 1993 will fully cover this.

4.2 Proposed programme budget for 1994-1995

The proposed programme budget for 1994-1995 totals US\$ 16.0 million, a 19.4% increase over the revised 1992-1993 budget. This includes 10% for inflation and a 9.4% real increase. While the amounts for health services and research will increase by 23.9% and 24.4% respectively, the amount for programme management and support will decrease by 14.6%. The increases in the health services component are primarily for regional and country activities, with the largest increase for AFRO. Nearly 50% of the total programme budget is at the regional and country level.

The increases for the research component will permit expansion of activities, including support for vaccine trials, development of interventions to reduce indoor air pollution, trials of simplified and less expensive antibiotic regimens, development of interventions to promote careseeking for young infants, and greater attention to health systems research.

Increased support will be required to fully fund the proposed budget.

5. Conclusions and recommendations

The following are the conclusions and recommendations of the Technical Advisory Group, produced following its review of the status and planned activities of the Programme.

5.1 General

5.1.1 The TAG reaffirms that the technical bases of the Programme's case management strategy are well established, and notes that a wide range of managerial tools for planning, training, communication, evaluation and surveillance have been developed and made available to ministries of health, cooperation agencies and nongovernmental organizations for use in national programmes. It recommends, however, that positive steps should be taken to accelerate the pace of implementation of the national control programmes to achieve the pneumonia mortality reduction target of one-third by the year 2000, as set at the World Summit for Children in New York in 1990 and the Forty-fourth World Health Assembly in Geneva in 1991.

5.1.2 The TAG lends its full support to the new initiative on the integrated case management of the most frequent childhood illnesses, coordinated within WHO by the Division of Diarrhoeal and Acute Respiratory Disease Control,³ and planned in collaboration with UNICEF. It encourages the Programme to pursue its leading role in this initiative, which is seen as the appropriate manner to crystallize the aspirations for effective integration of the Programme into the management of primary health care at district level. There is, however, a need to assure specific expertise in ARI at central level in countries. The TAG encourages the Programme to ensure that the development of the sick child initiative does not weaken the specific focus on ARI problems, but rather provides the optimal approach for achieving the objectives of controlling ARI mortality and morbidity in children.

5.1.3 The TAG notes with satisfaction that the financial contributions to the Programme have exceeded the initial expectations for the 1992-1993 biennium and that they have allowed more funds to be made available than anticipated in the budget for direct support to national programmes, in particular to the countries of the African Region. The TAG regards this progress as an extended recognition by the cooperation agencies of the magnitude of the ARI problem and of the technical and managerial credibility of the Programme. It recommends that cooperation be strengthened with UNICEF, UNDP, the World Bank, the bilateral cooperation agencies and NGOs in support to country programmes, and in research and development activities.

5.1.4 The TAG was informed that a working group comprising several participants at last year's Meeting of Interested Parties (MIP) will recommend to this year's MIP that an external review of both the ARI and CDD Programmes be carried out. The TAG believes that the review should emphasize the issues which are crucial in defining programme directions for the rest of the decade: the balance between research, development and services activities; the potential integration of ARI and CDD; and the Programme's integration with other child health activities at country level.

5.2 Technical policies

5.2.1 The Programme's two current ARI control strategies - case management and immunization with existing EPI vaccines against measles and pertussis - are the only strategies whose implementation can achieve the goal set at the World Summit for Children of a one-third reduction in pneumonia deaths by the year 2000. By then, the development and field-testing of new ARI vaccines and of other preventive interventions could provide means to prevent many more pneumonia episodes and deaths, if these interventions prove to be cost-effective and feasible for widespread implementation.

³ Programmes involved: Acute Respiratory Infections, Control of Diarrhoeal Diseases, Control of Tropical Diseases, Essential Drugs, Expanded Programme on Immunization, Maternal and Child Health, Nutrition, Oral Health, Prevention of Blindness, and Tropical Diseases Research.

5.2.2 No additional preventive strategies are currently recommended for implementation by the ARI Programme globally or by national ARI control programmes. The Programme should endorse the efforts of other WHO Programmes and agencies to reduce tobacco smoking, outdoor air pollution, low birth weight and protein-energy malnutrition; promote breast-feeding; and reduce the transmission of HIV.

5.3 Health services

5.3.1 Programme implementation

5.3.1.1 The TAG notes the progress made in implementing the ARI Programme in the various regions, but is concerned that 41 target countries are still without operational programmes. The TAG believes that if more technical assistance to target countries is provided more rapid implementation and expansion of programmes are likely to be achieved.

5.3.1.2 The TAG strongly recommends, to implement item 5.3.1.1, that recruitment of staff and training of consultants be undertaken. It notes that regional posts have been funded, yet remain unfilled. Even if this situation is corrected, the Programme must develop a pool of qualified consultants who can help national authorities to plan and implement programmes.

5.3.1.3 National programmes have been well served by Associate Professional Officers (APOs), and the TAG recommends that the Programme take steps with cooperating countries to increase the number of APOs in post.

5.3.1.4 The TAG commends the Programme on the steps it has taken to involve all agencies of the health sector in ARI activities. It is of great importance that the non-public sector become closely involved with the national health authorities, not only to ensure that appropriate ARI services are available to all children, but also to assure that the academic and private sectors support national programme activities. In particular the TAG commends the Programme in its collaboration with NGOs, bodies which provide a significant measure of public health, training and curative services in many countries.

5.3.2 Training

5.3.2.1 The TAG commends the Programme on the high quality of training materials that have been developed, and urges that greater utilization of these be made to accelerate the training component of national programmes. To ensure that the quality of performance remains high, ongoing supervision and monitoring of the practices of health workers who have been trained are essential. This can be accomplished by utilization of the health facility survey instrument, adapted as necessary, on a smaller scale.

5.3.2.2 The TAG recommends that the Programme explore indicators of the quality of training to assess whether it is possible to adopt a simple monitoring mechanism. The TAG looks forward to a review of progress on this at its next meeting.

5.3.2.3 The TAG notes that materials for training on the inpatient management of ARI cases are not yet available. These will be essential to meet the needs of national programmes and the TAG recommends that priority be given to their completion.

5.3.2.4 The TAG recommends that the training of trainers, an essential element in the development of high quality training, be emphasized in all national programmes. It is not sufficient that the trainers be skilled in clinical matters; they must also be trained in the management of training activities.

5.3.2.5 The TAG notes the emphasis given by the CDD Programme to basic education in attempting to change treatment practices of medical and nursing students, and recommends that development of training materials for basic education should be a priority for the ARI Programme. Emphasis should be placed on utilizing existing programme materials as much as possible rather than undertaking major revisions of medical curricula. Efforts must be made by the Programme to establish standard ARI case management in teaching hospitals as part of this basic training.

5.3.2.6 The TAG recognizes the valuable contributions that ARI Training Units (ATUs) are making, not only to training in case management but also to programme implementation and evaluation, and recommends the establishment of additional ATUs where feasible.

5.3.3 Communication and information

5.3.3.1 The TAG commends the Programme on the development of the focused ethnographic study instrument, and strongly recommends that information from ethnographic studies be used in the planning and evaluation of programmes, in the design of household survey questionnaires, and in the adaptation of training and communication materials.

5.3.3.2 The TAG urges the Programme to disseminate current information on ARI control through medical journals. This is important because of the need to involve both academic and private health professionals, who frequently do not have access to WHO publications.

5.3.4 Logistics

5.3.4.1 The TAG recognizes that the successful operation of the case management element of the Programme is dependent upon the continuous supply of drugs, and urges the Programme to work closely with the Essential Drugs Programme. The TAG

recommends that the ARI Programme develop means for determining the causes of failure in the logistics systems. These failures and their causes can be identified by various methods, including the Health Facility Survey, enabling corrective action to be taken.

5.3.4.2 Given that the use of antibiotics is the main case management technology for preventing mortality from pneumonia, a valid concern is that the standard antimicrobial treatment might become ineffective in places where bacterial drug resistance is increasing. The TAG recommends that the Programme make widely available the manual for the national surveillance of antimicrobial resistance of *S. pneumoniae* and *H. influenzae* as soon as field-testing is completed, and that it enlist the collaboration of international and bilateral agencies in support of the upgrading and quality assurance of national bacteriological and epidemiological services in charge of assessing the current bacterial drug resistance situation and monitoring future trends.

5.3.5 Monitoring and evaluation

5.3.5.1 The TAG notes that there are national programmes in various stages of development and exhibiting differing degrees of success. The programme evaluation results should be documented and disseminated to allow other programmes to learn from their success and failure.

5.3.5.2 The TAG recommends that the Programme should not initiate or encourage new disease-reporting mechanisms for national ARI programmes, but that existing information be used to the fullest extent. Although the TAG recognizes that health facility data are often of poor quality, national programmes should be encouraged to investigate the data that already exist in clinic and hospital logs and registers, as potential sources of information for programme planning and implementation.

5.3.5.3 The TAG calls attention to the urgent need for evaluation of national programme activities, not as a separate effort, but as an ongoing activity that begins with the initiation of the Programme. The Health Facility Survey and Household Survey are excellent existing evaluation tools that should be used for establishing baseline information for the planning and periodic evaluation of programmes.

5.3.5.4 The TAG recognizes the need for more frequent monitoring of programme activities. The Health Facility Survey and the Household Survey can be modified and used to provide information on weaknesses and problems in programme performance. In addition, the ARI Programme should assist national programmes to identify ways in which the existing information-gathering mechanisms of other programmes, such as CDD and EPI, can be used to meet ARI Programme needs.

5.4 Research component

5.4.1 Introduction

5.4.1.1 The TAG reviewed the progress in research to date, the workplan for 1993, and the results expected in the next five years, and commends the Programme for its excellent productivity. In particular, it notes the success in carrying out the multicentre study of young infants, the development and evaluation of the FES, household and health facility survey instruments and the progress with the review of preventive strategies.

5.4.1.2 The TAG supports the current balance in research among case management, behavioural, health systems and prevention areas. The TAG emphasizes the need for health systems research and looks forward to reviewing a strategic plan to expand it at its next meeting.

5.4.1.3 The TAG notes that health systems research for ARI case management represents an excellent opportunity to collaborate with Essential National Health Research (ENHR) as promoted by the International Commission for Health Research. National ARI programme staff should be encouraged to collaborate with ENHR efforts in their country using established ARI programme tools such as the Household and Health Facility Surveys and the Focused Ethnographic Study.

5.4.1.4 The TAG recommends that, where appropriate, research activities approach key ARI case management and prevention research questions in the context of the other major illnesses of children as presented in the sick child initiative. The TAG strongly supports plans for collaborative studies with other Programmes in WHO.

5.4.1.5 The TAG recommends that, to increase the opportunities for carrying out ARI research projects, the Programme recruit and involve researchers in developing countries. The involvement should only be through specific research projects and not through institutional research-strengthening grants.

5.4.2 Case management research

5.4.2.1 The TAG supports continued priority accorded to research for resolving key issues related to ARI case management strategy.

5.4.2.2 The TAG recommends continued attention to the performance of cotrimoxazole in areas where bacterial drug resistance has been demonstrated. Further analysis and data collection should be pursued in Pakistan to elucidate the relationship between laboratory evidence of resistance and clinical efficacy, including the exploration of possible benefits from an increased dose of cotrimoxazole. Once these results are reviewed, the need for additional sites for similar studies will be explored.

5.4.2.3 Since the availability of an effective, affordable oral antibiotic regimen for outpatient management of pneumonia is essential for the ARI case management strategy, the TAG recommends giving high priority to the exploration of simplified or cheaper antibiotic regimens, particularly oral amoxycillin with or without probenecid for outpatient use. In addition, studies to establish a less frequent dosing schedule of parenteral benzylpenicillin for inpatient use are recommended.

5.4.2.4 The TAG notes with satisfaction the excellent progress on the multicentre study of young infants. The TAG is confident that the results of this study and pharmacokinetic studies will help to guide case management in young infants.

5.4.2.5 The TAG notes with satisfaction the progress made on studies concerning clinical signs, etiology and treatment of severely malnourished children together with pharmacokinetic studies of chloramphenicol in this high risk group. Results from two ongoing studies should be reviewed before locating an additional study site.

5.4.2.6 The TAG gratefully notes the valuable contribution to the current research studies achieved by the application of standardized radiographic film interpretation by the Radiology Working Group, and welcomes its continuation.

5.4.3 Behavioural and communications research

5.4.3.1 The TAG notes with satisfaction the progress of research on the validation of the Focused Ethnographic Study, and on protocols to assist local adaptation and to test maternal comprehension of messages. The TAG recommends that these be incorporated into the *Guide to the use of FES data in national ARI programmes* and that this be made available to national programmes as soon as possible.

5.4.3.2 The TAG supports the proposal for a national programme instrument which will investigate health worker beliefs and behaviour. In this way, constraints experienced by health workers in their delivery of good case management after they have been trained can be analysed, and means to enhance the delivery of good case management developed.

5.4.3.3 The TAG encourages the Programme to explore interventions that will facilitate prompt careseeking for sick children, especially young infants.

5.4.3.4 The TAG strongly supports plans to evaluate antibiotic packaging as one means of improving compliance with antibiotic therapy.

5.4.3.5 The TAG recommends that research into recognition of ARI, household management of the sick child, and careseeking, be explored in the context of other major childhood illnesses, as part of the sick child initiative.

5.4.4 Health systems research

5.4.4.1 The TAG notes with satisfaction progress made with the World Bank in estimating costs of outpatient ARI case management, as part of the integrated case management of the sick child. The TAG notes the growing collaboration with other WHO Programmes in the exploration of the cost-effectiveness of various elements of national programmes for the control of ARI in the context of the management of the sick child.

5.4.4.2 The TAG endorses the requirement to obtain valid information on patterns of antimicrobial susceptibility of *S. pneumoniae* and *H. influenzae* in countries implementing national ARI control programmes, and recommends that serotyping of invasive strains of *H. influenzae* and *S. pneumoniae* be part of the surveillance programme. It supports the completion of field-tests of the manual for the national surveillance of antimicrobial resistance of *S. pneumoniae* and *H. influenzae*: epidemiological and microbiological methods. It encourages the Programme to continue to explore methods of simplifying the laboratory and surveillance methods.

5.4.4.3 The TAG welcomes the finalization of the *CDD/ARI Household survey manual* and *Health facility survey manual* and supports their implementation. The TAG recommends the development of an inpatient facility survey instrument and the development of protocols for use by national programme to monitor inpatient case-fatality rates stratified by severity of pneumonia. The TAG notes the mediocre performance of cross-sectional survey methods to measure ALRI-specific mortality and advises against their use in the evaluation of national programmes until further research to improve their performance has been carried out.

5.4.4.4 The TAG recommends that priority be given to the development and evaluation of systems to maintain the quality of delivery of the case management package. These systems should include methods for continuous quality improvement, and the exploration of ways to improve on-site supervision and combine supervisory visits with refresher training. In view of the sick child initiative, the TAG recommends that future health systems research projects on monitoring and supervision address other major health problems of children, in addition to ARI.

5.4.4.5 The TAG recommends that the Programme distribute guidelines for oxygen treatment and commission an economic analysis of alternative oxygen supply methods in developing countries.

5.4.4.6 The TAG recommends that experience in the implementation of the case management strategy, including the constraints encountered, should continue to be used to identify questions and priorities for health systems research.

5.4.5 Prevention research

5.4.5.1 The TAG compliments the Programme on the progress in reviewing risk factors for childhood pneumonia and the potential preventive interventions (see Section 3). The TAG encourages the Programme, in completing the review, to clarify the extent to which high-risk infants can be identified for special attention.

5.4.5.2 The TAG supports the conclusions of the prevention review concerning the likely impact of known interventions and the recommendations for investment of effort as set out in the report to the TAG.

5.4.5.3 The TAG notes with satisfaction that a field trial to determine the efficacy of *H. influenzae* type b (Hib) conjugate vaccine in preventing pneumonia has been started in Gambia with partial support from the Programme. The results of this trial are expected in 1996. Because of the large body of efficacy studies from developed countries linking efficacy to immunogenicity, local studies of immunogenicity should be encouraged, to allow extrapolation of efficacy results from the Gambian study to other areas.

5.4.5.4 The TAG encourages the involvement of the Programme in planning, facilitating and monitoring immunogenicity and efficacy trials at suitable sites in developing countries to determine the potential of pneumococcal conjugate vaccines to prevent pneumonia and colonization by *S. pneumoniae*. Given the potential high impact on pneumonia deaths, high priority should be given to the development and field-testing of pneumococcal conjugate vaccines.

5.4.5.5 The TAG encourages the Programme to follow the results of investigations for determining the advantages and disadvantages of maternal immunization against *S. pneumoniae* and Hib to prevent severe pneumonia in the first months of life.

5.4.5.6 The TAG supports the plans to launch an intervention trial to assess the impact of reducing indoor air pollution on childhood pneumonia, low birth weight, and other health outcomes. Although the Programme has provided essential technical leadership for the initiation of the project and should continue to coordinate the international study group and implement essential developmental studies, the Programme will probably only be able to provide a limited part of the total cost of the main studies and should therefore be active in mobilizing collaborating agencies and institutions.

5.4.5.7 The TAG commends the rapid, comprehensive meta-analysis and review of all available data on vitamin A supplementation and pneumonia. The TAG supports the programme recommendation against delivering vitamin A supplements to infants under 5 months of age, except for treatment of measles and eye signs suggesting vitamin A deficiency, until research establishes safety (both in terms of acute toxicity and ALRI morbidity). In collaboration with other WHO Programmes, the ARI Programme should provide financial and technical support to the planned multicentre study of the safety of

vitamin A given with vaccination at 6, 10 and 14 weeks which will measure acute toxicity, ALRI and diarrhoeal morbidity, and the immune response to vaccines.

5.4.5.8 The TAG recommends that the Programme investigate chilling as a potential risk factor for pneumonia by further review of existing data and by exploring approaches to studying the problem.

5.4.5.9 The TAG supports the proposal by the Programme to produce guidelines for improving methods for prospective surveillance of pneumonia to facilitate intervention trials, especially of preventive interventions.

5.5 Budgetary matters

5.5.1 The TAG approves the revised budget for 1992-1993 of US\$ 13.4 million, and is pleased to see that increased contributions to the Programme permit this 14.4% increase over the previous budget for this period.

5.5.2 The TAG welcomes the significant increase in funding for activities in the African Region, and hopes that this will stimulate increased efforts there.

5.5.3 The TAG reaffirms its recommendation that the Programme secure specific funds to assist the ARI control programmes of the newly independent states of Eastern Europe and Central Asia, in which pneumonia appears to be a leading cause of childhood mortality.

5.5.4 The TAG approves the proposed budget of US\$ 16.0 million for 1994-1995, which represents a real increase of 9.4% over inflation, and believes that the progress demonstrated by the Programme thus far fully justifies the expansion of both services and research activities. It urges the Programme to continue its efforts to identify sources of financial support.

6. Ninth meeting of the Technical Advisory Group

The TAG decided to hold the next meeting on 7-9 March 1994 at WHO Headquarters in Geneva. If the Meeting of Interested Parties were to proceed with the External Review as recommended by the MIP ad hoc working group which met in February 1993, the TAG would recommend that the Programme convene the entire group in 1994 so that all TAG members could participate in the discussion of the Report of the External Review. It also suggested that this Report be reviewed in a joint session with the CDD TAG which would meet from 9-12 March 1994, the last day of the ARI TAG meeting coinciding with the first day of the CDD TAG meeting. Once the Meeting of Interested Parties had taken a decision on the External Review, the Programme would

finalize the arrangements for the 1994 meeting in consultation with the Chairmen of the ARI and CDD TAGs.

Whatever the decision on the External Review, the TAG proposed that the agenda of the 1994 meeting include a limited overview of the status of the Programme and the following topics for presentation and discussion:

- a review of the Programme's key indicators and targets, including indicators on the quality of training;
- a strategic plan for health systems research;
- an updated report on the review of the effectiveness, feasibility and cost of preventive strategies;
- plans for the surveillance of bacterial drug resistance, including the experience gathered in Pakistan and other field-testing sites.

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