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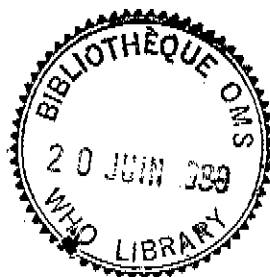
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PROGRAMME OF ACUTE RESPIRATORY INFECTIONS

REPORT OF THE FOURTH MEETING OF THE
TECHNICAL ADVISORY GROUP
(Geneva, 6-10 March 1989)



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1. INTRODUCTION

The fourth meeting of the Technical Advisory Group (TAG) of the Programme for the Control of Acute Respiratory Infections (ARI) was held in Geneva from 6 to 10 March 1989. The meeting was opened by Dr T. Bektimirov, Assistant Director-General, who welcomed the participants on behalf of the Director-General. He drew attention to the fact that the acute respiratory infections are still a serious public health problem, causing about 4 million childhood deaths each year. However, since 1983, a case management strategy has been developed which represents a basis for the implementation of ARI control programmes that can substantially reduce this mortality. The task of the TAG would be to guide the Programme towards global implementation by indicating the best means of providing support for national programmes, and priorities for research to acquire new knowledge. Its recommendations would be considered by the Programme's contributors at the Meeting of Interested Parties in June.

Dr J. Borgoño was elected as Chairman.

2. STATUS OF THE PROGRAMME

The TAG reviewed the progress made by the Programme in 1988, as described in detail in the 1988 Programme Report¹, and noted the planned activities in 1989.

2.1 Global Programme

In 1988 the Programme undertook a revision of its managerial and clinical management materials and the production of new operational instruments. At the same time, it increased the support given to national control activities and continued to promote and support research and development.

2.1.1 Health services component

Correct case management remains the central strategy to reduce child mortality due to acute respiratory infections, particularly pneumonia. Immunization is also recommended as a specific strategy to prevent respiratory infections caused by diphtheria, measles, and pertussis (thereby further reducing ARI deaths). In addition, national ARI programmes are being advised to support and strengthen nutrition and MCH/family planning programmes, since malnutrition and low birth weight appear to be the most important risk factors for pneumonia in young children in developing countries. In the second part of 1989 the Programme will initiate an analysis of available information on the effectiveness, feasibility, and cost of possible interventions that may eliminate or reduce the risk factors for acute lower respiratory infections (ALRI) in children, with the aim of identifying specific areas of preventive activity for ARI programmes.

In 1988 the Programme undertook a revision of its guidelines for case management, based on new evidence available from recent research and experience gained in the use of the WHO materials in regional workshops, training courses, and control programmes. While the core protocol for the clinical management of pneumonia remained unchanged, a number of important modifications or new instructions were introduced concerning the classification of ARI, diagnosis of neonatal pneumonia, management of wheeze, and reassessment of a child with pneumonia after two days of antimicrobial treatment at home. The key elements of the revised protocol have been condensed into an "ARI Treatment Chart" in which the recognition and treatment of pneumonia is the most prominent feature. A field test of a prototype chart carried out in 1988 showed that paramedical health workers could be taught to use it with relative ease. The manual for doctors, "Respiratory infections in children: Management at small hospitals", is also being revised to incorporate these changes and some others with respect to the management of upper respiratory infections. It will also contain more

¹ Document WHO/ARI/89.3

information about treatment with oxygen, the use of bronchodilators, and supportive care for the child in hospital and at home.

The ARI Programme has identified two procedures related to the prevention of mortality for which appropriate technology is required, namely, counting the respiratory rate for the diagnosis of pneumonia and supplying oxygen for the treatment of severe pneumonia at small hospitals. For the former, the Programme has drawn up specifications for a suitable 30- and 60-second timer and is distributing these, with UNICEF assistance, to potential manufacturers. For the latter, the recent advent of a small oxygen concentrator has raised the possibility of assuring a reliable supply in small hospitals. A meeting of a small group of clinicians and experts in the electroengineering of oxygen concentrators has been arranged in London in May 1989 to draw up specifications for a simple and robust piece of equipment.

By the end of 1988, 23 countries, mostly in the Regions of the Americas and the Western Pacific, had operational ARI control programmes; eight of them started operations during the year. Only four countries reported having expanded their programme on a national scale; in the other 19, the case management strategy has been introduced initially in a few limited areas. Another 10 countries have issued technical guidelines and drafted a plan of operation. During 1988, WHO staff members and consultants visited 31 countries to collaborate in formulating technical policies, revising guidelines, drafting plans of operation, or conducting training courses. In 1989, it is planned to hold intercountry meetings to develop case management guidelines for national ARI programmes and review other programme policies in the Regions of Africa, the Americas, and the Eastern Mediterranean. In addition, headquarters and regional office staff will visit countries to assist in outlining technical policies and plans of operation.

In the area of training, the major effort at the global level during 1988 has been the development of a training course for programme managers. The course will be completed and field-tested in 1989. With a view to strengthening training on case management of ARI, the Programme provided support in 1988 for the establishment of ARI Training Units (ATUs) in large facilities in six countries. The initial experience gained in conducting courses at these units during 1989 will help the Programme to prepare a Director's Guide and set of training materials for use in ATUs.

At the regional level, the Programme continued to provide available materials, such as technical guidelines, modules on case management for supervisory skills courses and clinical training, and a package of audiovisual aids, to assist in national training activities. National seminars or workshops were held in nine countries in the Regions of the Americas, South-East Asia, and the Eastern Mediterranean, and attended by a total of 841 participants; and 13 countries reported having conducted mid-level training courses during the year. In many of these activities extensive use was made of the two ARI modules on case management, namely, "Management of the Child with Cough" and "Management of the Child with Ear, Nose, and Throat Infection". A revision of these modules was initiated in 1988 and will be completed in 1989; they are being combined into a single module. The available audiovisual materials (flipcharts and slides) are also being revised and new versions will be available in mid-1989.

Activities in the area of monitoring and evaluation were mainly developmental; they included an analysis of available data and a search for information needed to develop appropriate and reliable survey instruments for these activities. Visits by consultants to a number of countries in 1988 showed that better training and supervision of health facility staff are required to ensure proper implementation of the technical guidelines on case management. They also indicated that current clinical practices should be assessed during the planning of national programmes. The Programme therefore plans to prepare a health facility survey instrument to evaluate the extent to which health providers conform to national case management guidelines. It has also identified the main issues involved in developing an instrument to collect information on knowledge, attitudes, and practices of mothers and other caretakers, with a view to developing suitable messages and health education materials on the home management of ARI.

The most important indicator for measuring the performance of an ARI control programme is likely to be a "correct use indicator", i.e., the proportion of pneumonia cases in children managed according to standard treatment guidelines. The best way to measure this is through a community-based morbidity and treatment survey; such an instrument will be prepared during 1989. As regards mortality surveys, an attempt is being made to improve the definition of death from pneumonia and to develop simpler techniques to measure overall childhood mortality.

During 1988 the Programme reviewed its previous efforts to develop a global surveillance system capable of monitoring the resistance of Streptococcus pneumoniae and Haemophilus influenzae to antimicrobial agents, and decided to focus its future efforts on strengthening national capabilities in the expectation that the aggregation of reliable national data will provide information for a global assessment of the problem. A manual is being developed for this purpose which will describe the epidemiological and microbiological methods required for the surveillance of antibiotic resistance; it will be field-tested in mid-1989.

2.1.2 Research component

During 1988 plans were made for an expansion of the research activities of the Programme. An initial step was the development of draft guidelines for the management of research activities. In addition, in May 1988, at a meeting organized by the Programme in Hanover, Federal Republic of Germany, it was agreed that the ARI Programme should focus its support of biomedical and epidemiological research on the problem of ALRI, particularly pneumonia, in young children in developing countries. Priority research topics were outlined in the broad areas of epidemiology, etiology, and disease prevention; case management; and vaccine development and diagnostic tests. The Programme plans to convene a Scientific Working Group to help establish research priorities and strategies, review proposed projects and advise on their support, and monitor the progress and results of supported studies. A preliminary, informal meeting of experts was held in November 1988 to help plan this effort.

Several important research questions relating to implementation of the case management strategy were identified as needing rapid resolution, and investigations were planned during 1988 to: (a) determine whether a 30- or a 60-second measurement of the respiratory rate is most suitable for the case detection of pneumonia, and whether it is best done when the child is breast-feeding, awake, or asleep; (b) test the ability of first-level health workers to observe accurately a series of clinical signs and decide on that basis whether infants under 2 months of age have a serious bacterial infection; and (c) determine whether nurses can be trained to identify wheeze without the use of a stethoscope, administer nebulized salbutamol by footpump or metered-dose inhaler, and assess response to therapy.

A meeting of principal investigators and consultant epidemiologists was held in April 1988 to analyse the results of seven ARI intervention studies which sought to determine the impact of the case management strategy delivered through community health workers (see section 3).

2.1.3 Programme management

In August 1987, the ARI Programme at WHO headquarters was placed administratively under the responsibility of the Diarrhoeal Diseases Control (CDD) Programme. During 1988 three new posts were created at headquarters and all the regional offices designated a responsible officer for ARI activities.

The status and plans of the Programme were presented to the donor community at the CDD Meeting of Interested Parties (MIP) on 1 July 1988. The MIP warmly endorsed the Programme's plans and 1988-1989 budget, and decided that in future (i) the MIP would serve as the donor forum for the CDD and ARI programmes, and (ii) the funding mechanisms adopted by the donors for CDD would apply also to ARI.

2.2 Regional programmes

The TAG reviewed the reports of the regional advisers and noted the following major developments in the six WHO regions (up to March 1989).

2.2.1 Africa

To date, four countries in the Region (Gambia, Malawi, Swaziland, Zimbabwe) have undertaken ARI control activities, though only those in Zimbabwe are nationwide. Consultant services were provided to Gambia and Malawi for programme planning. In 1988, ARI training materials were used at an intercountry course in Swaziland, and materials for community health workers were tested in the United Republic of Tanzania and Zambia. Research on indoor air quality was conducted in Kenya and Zambia.

A promotional seminar for eight English-speaking countries is scheduled in Cameroon in May 1989. As interest, commitment, and resources increase at the community, national, and international levels, it is hoped to develop a regional plan of action.

2.2.2 Americas

To date, 17 countries have prepared national technical guidelines for the control of ARI, 15 have a plan of operation, and 10 have started programme implementation. Advisory services were provided by regional staff and consultants to 17 countries in 1988. Three intercountry workshops and four national workshops on the organization and implementation of ARI control programmes were held, and nine courses for mid-level supervisors were conducted in four countries. Evaluations of ARI control activities were carried out in Argentina, Bolivia, and Mexico, and yielded important information for the future orientation of programmes and policies.

The Regional Office continued to publish the bibliography "Respiratory Infections in Children" and the Spanish version of the newsletter "ARI News". A number of technical documents and guidelines on ARI were translated into Spanish and/or Portuguese and widely distributed in these languages and in English. They included two manuals for physicians entitled "Tratamiento de las IRA" (10 000 copies) and "Manejo de las IRA para Médicos" (7000 copies), and the "Guía para Planificación del Programa ARI". The Regional Office also continued to translate, adapt, and distribute educational materials.

In 1989-1990, it is planned to promote more activities to evaluate the progress and impact of national programmes. A group of consultants will be trained in PAHO/WHO policies and strategies and greater use will be made of such staff for country visits. Systematic support activities will be developed in six countries where ARI are a particularly severe problem. Increased support will be given for training courses at national level and in schools of medicine and nursing (jointly with CDD).

2.2.3 South-East Asia

Most countries in the Region have established a national committee, task force, or advisory committee on ARI to formulate control activities. During 1988, Burma, India, Indonesia, and Sri Lanka prepared plans of operation and technical guidelines for case detection and management. Bangladesh prepared a draft plan of action, and Nepal and Thailand expressed an intention to develop plans by mid-1989. A staff member visited five of these countries to collaborate in formulating technical policies and drafting plans of operation.

During 1988, more than 500 physicians participated in seminars and workshops on ARI organized in five countries, and some 400 participants were trained in mid-level courses in four countries. Training and informational materials were widely distributed and translated into seven local languages.

By the end of 1989, it is expected that most countries in the Region will have developed national plans and started implementing programmes. Training activities in case management have been planned, using the new materials that are being developed.

2.2.4 Europe

The public health importance of ARI, both for children and the elderly, has been recognized in the Region, and Member States have acknowledged the need to control ARI, especially influenza and pertussis. Most countries consider ARI control to be an integral part of primary health care, and would be willing to take part in a programme that can be integrated into the existing system of health services. However, one country (Turkey) has launched an ARI programme, and some Mediterranean countries are considering the inclusion of ARI control in child survival programmes or similar activities. Interest has been expressed in adopting the technical guidelines developed by WHO and in participating in training activities aimed at improving the efficiency of ARI treatment in health care services.

2.2.5 Eastern Mediterranean

To date, national ARI programmes have been formulated with WHO assistance in Oman, Sudan, and Tunisia. Good progress is being made in developing programmes in Egypt, Morocco, and Pakistan, and discussions have been held on the formulation of plans in the Islamic Republic of Iran, Jordan, and the Syrian Arab Republic. The programme in Oman was evaluated in late 1987, and a mortality, morbidity, and treatment survey was conducted in Tunisia in the same year.

Priority has been given to training, especially the establishment of sub-regional training centres for clinical management of ARI. One such centre has been established with WHO support in Egypt, and it is hoped that two others will become functional in Pakistan and Tunisia in 1989.

By the end of 1989, 25% of the countries of the Region, including those with the largest populations, will have developed national ARI programmes. In the next two years increased emphasis will be placed on planning, operational, and training activities as new and revised manuals and training modules become available. Current training curricula for different categories of health staff will be reviewed and adapted, and ARI training units established in designated health facilities. The problem of antimicrobial drug resistance in S. pneumoniae and H. influenzae will be monitored in selected laboratories.

2.2.6 Western Pacific

In 1987-1988 technical support was provided to 11 countries with a view to establishing national ARI control programmes. Of these countries, seven have a plan of operation and have initiated training activities on case management for staff at the provincial, district, and community levels. Support was provided for the development of an ARI clinical management training unit in the Philippines, and courses will start there in June 1989. Various WHO materials were distributed in 21 countries or areas. China and the Philippines developed their own training and health education materials, and WHO materials were translated into local languages in Laos, Republic of Korea, and Viet Nam.

Health systems research was carried out in four countries to identify and seek solutions for operational problems. One of the main findings was that the majority of health workers at the periphery can have difficulty in following the WHO-recommended protocol for case management. Efforts to strengthen supervision should help to improve treatment practices. The development of programmes has been hampered in some countries by a shortage of antibiotics at the periphery, and inadequacies in the drug procurement and distribution system.

In 1989-1990 the Region expects to provide support for the planning of national programmes in a further eight countries, while plans of operation will be finalized and programmes implemented in three others. Existing programmes will be expanded through training activities in seven countries, and evaluations will be carried out by various means in 10 countries. ARI training units will be established in five countries, and antibiotic sensitivity monitoring will be carried out in 13 countries.

3. RESULTS OF THE ARI INTERVENTION PROJECTS

WHO established the ARI Programme in 1982 with a view to combating pneumonia as an important cause of mortality in children. Studies in the 1970s in Punjab State, India, demonstrated that paramedical health workers could recognize pneumonia and treat it with antibiotics. Other studies during the same period in Papua New Guinea showed that the diagnosis and treatment of ARI could be simplified by using the respiratory rate to distinguish pneumonia from milder respiratory infections. These studies also documented the predominance of S. pneumoniae and H. influenzae as causes of serious pneumonia in children and developed case management protocols.

To further investigate the efficacy of a community-based case management strategy the Programme initiated a series of studies in 1982. Out of 10 studies begun with WHO support between 1983 and 1985, six were fully implemented and their results were reviewed at a meeting convened by the Programme in April 1988. Preliminary results from one additional study in Jumla, Nepal (supported by USAID) were also reviewed.

These intervention studies had in common the recognition of the signs of pneumonia and the provision of antibiotic treatment. In four of the seven studies immunizations were implemented as part of the ARI intervention and, in some, other elements of primary health care, such as management of diarrhoea and nutritional problems, were also begun simultaneously. The study populations varied in a number of aspects, including their level of childhood mortality, prevalence of malnutrition and other health problems, availability and quality of health services, and socioeconomic level. The studies also varied in their research design (having concurrent control areas or before-and-after comparisons, or both), method of identification of cases of pneumonia, treatment protocol, and choice of antibiotic. They generally used infant and childhood mortality rates to evaluate the impact of the intervention and further attempted to determine the cause of death by questioning family members of children who died about the signs and symptoms observed prior to death, the so-called "verbal autopsy" procedure. This information was then used to calculate the ALRI-specific and total mortality rates.

Three of the seven studies were able to evaluate the case management strategy alone since other interventions, such as immunizations, were implemented to the same degree in the case management intervention and control areas. One of these studies, in Abbottabad, Pakistan, targeted children under 5 years and sought to identify pneumonia by household visits every two weeks. Cases of pneumonia identified by community health workers (CHWs) were treated with co-trimoxazole. The study demonstrated a reduction in total and ALRI-specific mortality, both in infants and in all children under 5 years of age. A second study in Bohol, Philippines, utilized passive case-finding, but to date has provided little maternal (or even family) education on the signs of pneumonia and the reasons for seeking medical attention. Thus, the study has probably succeeded in providing treatment to only a small number of cases needing therapy and, not surprisingly, has so far had only a modest and non-significant effect on childhood mortality. However, a reduction of borderline significance in non-measles-associated ALRI mortality has been found.

In the third study, in Jumla, the intervention was gradually introduced in a population of 75 000. After a two-year period of evaluation there appeared to be no reduction in total or ALRI-specific childhood mortality. However, during this period the coverage of the intervention may have been limited owing to the reliance on active case-finding by household visits carried out only every two weeks, which resulted in therapy being initiated late or not at all in many cases. It should also be noted that the population included in this study was characterized by an exceptionally high childhood mortality level, severe

malnutrition and poverty, and poor availability of other health services. A third year of intervention is under way to determine whether earlier detection and treatment of cases, including the large proportion of cases (and deaths) occurring in the first three months of life, will have a greater impact on mortality.

Each of the other four studies in which ARI case management was combined with increased immunization coverage had a significant impact on mortality rates in the target population. A study in Bagamoyo, United Republic of Tanzania, provided community education on ARI and detected and treated with co-trimoxazole the cases that were brought to health workers. A sizable drop in total and ALRI-specific childhood mortality was found. In a second study in the Kathmandu Valley, Nepal, in which cases were detected by household visits and treated with ampicillin, a significant reduction in total and ALRI-specific mortality was found in both children and infants. In a third study in Haryana, India, which focused on the management of pneumonia in low-birth-weight infants, ALRI-specific infant mortality was found to be 60% lower in the intervention than in the control areas. Finally, in a fourth study in Kediri, Indonesia, in which case-finding was done by household visits and co-trimoxazole was provided by CHWs, total childhood mortality decreased and ALRI-specific mortality fell by about 75%. Although the impact of the case management intervention in these studies cannot be fully separated from the effect of immunizations, especially against measles, it is likely that the treatment of pneumonia accounted for a substantial proportion of the mortality reduction. This was concluded from subanalyses of data from these studies, which indicated that a small fraction of the ALRI deaths, even in the control populations, was associated with measles and that the mortality reduction was seen in children in the first six months of life, an age when measles vaccine could not have had any effect.

In summary, these studies indicate that an ARI case management intervention, as generally delivered in these studies - i.e., with household visits for case-finding and provision of therapy by CHWs - could have a substantial impact on ALRI-specific and total childhood mortality. It seems reasonable to conclude from these studies that paramedical staff working in the community and at first-level health facilities can be trained to recognize and successfully treat pneumonia. It must be taken into account, however, that these studies were not implemented as an ARI control programme within a national health infrastructure, which would need to rely on community education activities to teach caretakers how to recognize illnesses needing therapy (not household visits) and on the efforts of multi-purpose health workers. While the studies provide additional evidence to justify the development of ARI control programmes on a wider scale, it will be important to evaluate such programmes as they are implemented, in order to improve their performance and determine their effectiveness in achieving service targets and possibly in reducing mortality.

4. TECHNICAL GUIDELINES ON CASE MANAGEMENT

The main task of the ARI Programme is to focus attention on the aspects of case management that will reduce under-5 mortality. Since it is estimated that 60-80% of ARI deaths in developing countries are due to bacterial pneumonia, case management should focus on the detection and treatment of that disease.

Key elements in reducing child mortality from pneumonia are early case detection, prompt delivery of antibiotic treatment using a drug effective against *H. influenzae* and *S. pneumoniae*, assurance of compliance, and follow-up to detect treatment failures. The WHO case management guidelines recommend that pneumonia case detection be based on clinical signs alone, without auscultation, chest X-ray, or laboratory diagnostic tests. The only equipment required is a simple timing device. Careful training is needed to ensure correct counting of the respiratory rate and recognition of chest indrawing and other signs of severity in children with cough or difficult breathing. This approach - empiric use of antibiotics for suspected pneumonia based only on a physical examination - is justified in settings with a significant risk of bacterial pneumonia. It is less appropriate in settings where this is not true; for example, in countries with an IMR of less than 40.

At the primary-care level (the first-level facility and community health workers), standard pneumonia case management as outlined in the new ARI Treatment Chart is recommended. However, most children presenting with cough do not have pneumonia. The mothers of these children should receive home-care instructions, which include advice to continue feeding (and increase feeding after the illness if weight has been lost), to clear a blocked nose if it impedes feeding, to increase the amounts of fluid given during the illness, and to soothe the throat or relieve the cough with simple, safe remedies, avoiding commercial cough or cold remedies. The most important home-care instruction is to watch the child for signs indicative of pneumonia: breathing becomes faster or more difficult, or the child is unable to drink or generally becomes more ill. These instructions must be adapted to the local situation to ensure that children with possible pneumonia will be recognized by the mother and brought for care. In addition, in some programmes, health workers will be trained and equipped to provide specific management for acute and chronic otitis media and to treat streptococcal sore throat.

At the primary-care level, all children under 2 months of age with suspected pneumonia or sepsis and children 2 months through 4 years with signs of severe infection should be referred when feasible. Programmes will need to improve the access to small hospitals that are able to manage severe cases of pneumonia and other ALRI. How elaborate the care will be at this level will vary from place to place. Ideally, four parenteral antibiotics, namely, benzylpenicillin, chloramphenicol, cloxacillin, and gentamicin, should be available at this level to treat children adequately. Simple instructions for administering these antibiotics, oxygen, fluid therapy, and bronchodilation, and for reassessing the child during therapy, will be provided in the revised version of "Respiratory infections in children: Management at small hospitals".

In areas where wheezing is a significant problem and health workers at first-level facilities are supplied with bronchodilators, a section can be added to the standard Treatment Chart which provides advice on the trial administration of a rapidly acting bronchodilator in wheezing children presenting with cough or difficult breathing. This protocol ensures that antibiotic treatment is provided for children with wheezing who may have pneumonia, and that the child with significant airway obstruction who has a poor response to a bronchodilator or danger signs (cyanosis, inability to drink, or a respiratory rate greater than 70) is referred. Nebulized salbutamol is recommended, since it is both safe and effective. This approach should reduce the number of children referred who could be safely treated at home on a bronchodilator.

The case management protocol for infants under 2 months (extended neonatal period) differs from that used for older children for several reasons. In the former, pneumonia or another serious bacterial infection may present with non-specific signs and, since their treatment is basically the same, it is not necessary to teach health workers to distinguish between them. The normal respiratory rate is higher and more variable in neonates; mild chest indrawing is common, and many neonates with pneumonia do not cough. The efficacy of home antibiotic treatment has not been established for neonates with pneumonia or other forms of sepsis, and thus hospital referral and parenteral treatment with penicillin and gentamicin are recommended. If referral is impossible or refused, an oral antibiotic can be tried. Supportive care instructions also emphasize the importance of thermal control in the very young.

5. RESEARCH MANAGEMENT PLAN AND PRIORITIES

5.1 Research management plan

The goals of the research component are, first, to improve the content and delivery of the case management strategy and, second, to develop other tools and approaches for the control of ARI. The former will require clinical, behavioural, and survey-related research and development of applied technologies; the latter will involve epidemiological and etiological research, studies to improve diagnostic tests, and vaccine development and testing.

It is planned to manage a part of this research through the creation of a global Scientific Working Group composed of experts from outside WHO. They would review and support research that is a longer-term undertaking, is often developmental, and addresses complex questions that require consideration by a number of recognized experts. Much of this research will involve specialized biomedical sciences, e.g., microbiology and immunology. Examples of such research might be: improved clinical criteria for neonatal pneumonia and its etiology, clinical trials of simplified antibiotic schemes, and field-testing of an H. influenzae type b vaccine.

Research that is of a more short-term nature, in areas where results are required quickly, would be managed directly by the headquarters Secretariat. Such research will in general be of a practical nature, highly focused, and address well-defined operational problems. All such research will be commissioned and undertaken at readily identifiable institutes. It will include, for example, determination of the best means of counting the respiratory rate and assessing the response of wheezing children to salbutamol, research into mothers' perceptions and ability to recognize the signs of pneumonia, and studies of the correlation of the antibiotic resistance patterns of invasive and nasopharyngeal strains of H. influenzae and S. pneumoniae.

Small-scale research projects that address the problems and constraints of specific national ARI programmes will be supported by the regional offices through the services component.

5.2 Research priorities

The following is a brief overall summary of research needs in the area of ALRI; the Programme will need to define its priorities among these.

5.2.1 Case management research

(a) Case detection: In the infant aged less than 2 months, studies are needed to determine the simplest set of clinical signs with the best sensitivity, specificity, and predictive value for neonatal pneumonia or other sepsis. Studies are also planned to determine the feasibility of training first-level health workers to recognize these signs and accurately manage such cases. Studies are required in older children at first-level facilities to further assess the criteria for deciding which should be examined for possible pneumonia and which have severe pneumonia. Studies of the clinical signs of pneumonia are needed also in severely malnourished children, who have a particularly high risk of mortality. Studies of respiratory rates measured by health workers and by continuous recordings are planned to determine the relative accuracy of 30- and 60-second measurements and the effect of breast-feeding and fever on the respiratory rate. The results of these studies will help in formulating optimal recommendations for health workers on accurate measurement of the respiratory rate.

(b) Treatment: Studies that compare the standard oral regimens for the treatment of pneumonia with shortened or simplified schedules are needed, both to demonstrate the efficacy of the current recommendations and to evaluate regimens that might be cheaper and simpler. There is also a need for pulse oximetry studies to help determine how often children with severe pneumonia are significantly hypoxic. In addition, studies are required to confirm the adequacy of co-trimoxazole in clearing P. falciparum parasitaemia in children under 5 years of age. This would support the use of this drug without an additional antimalarial in children with suspected pneumonia and a fever in a falciparum-malarious area (in the absence of signs suggesting cerebral malaria).

(c) Behavioural research: Of critical importance to early pneumonia case detection and prompt treatment are knowledge about mothers' ability to recognize the signs of pneumonia, the sequence and timing of care-seeking, and compliance with treatment. Behavioural research is needed to develop simple methodologies to identify the signs that mothers recognize as severe and to determine their relationship to clinical pneumonia.

National programmes need efficient methods to determine the signs that are best, both for developing home-care advice and for survey instruments. In addition, in-depth ethnographic studies are needed to identify significant, modifiable risk factors for pneumonia incidence, severity, or outcome.

(d) Survey-related research: In order to develop credible household morbidity, mortality, and treatment surveys, research is needed to validate interview techniques for detecting ALRI episodes and deaths. More needs to be known at the community level about the relationship of clinical signs and mothers' perception of them to radiographically diagnosed pneumonia.

Research is planned to compare the antibiotic sensitivity of nasopharyngeal and invasive strains of S. pneumoniae and H. influenzae. If there is good correlation the monitoring of antibiotic sensitivity in national programmes would be simplified.

(e) Applied technology: The Programme is promoting the development of simple timers, field-durable oxygen concentrators, and robust otoscopes. The adequacy of flow and salbutamol particle size achieved with a footpump nebulizer are being determined.

5.2.2 Other research

(a) Epidemiological research: Although ARI are prevalent in practically all areas, the factors responsible for variations in disease severity are poorly understood. Identification of the factors that are potentially modifiable would have important implications for disease control. Other epidemiological research should include (i) population-based studies to document the incidence of invasive S. pneumoniae and H. influenzae disease (an essential prerequisite for vaccine trials), and (ii) an analysis of S. pneumoniae serotypes in young children in developing countries, to guide the development of relevant conjugate vaccines.

(b) Etiology research: The most important need in this area is for studies of the etiology of ALRI and sepsis in young infants in the extended neonatal period (under 3 months of age) as a basis for determining optimal therapeutic regimens and orienting future vaccine assessments. Etiological studies are also needed in malnourished children, who may have disease caused by a different spectrum of pathogens, including some that might require special therapeutic approaches.

(c) Diagnostic methods: Improved clinical and laboratory methods for diagnosis could lead to improved treatment and prevention of ALRI, and would be especially useful for determining the etiology of disease. Etiology-specific tests (e.g., an immunological test to detect bacterial antigens in urine or serum, or antibody responses) will be particularly valuable in trials of candidate bacterial vaccines.

Guidelines need to be developed for interpreting chest radiographs of young infants for use in studies to define cases of pneumonia.

(d) Vaccine trials: In preparation for vaccine trials, there is a need for population-based studies to establish case definitions for pathogen-specific diseases (e.g., pneumonia, bacteraemia, meningitis); this information is needed to determine their frequency, and hence sample sizes and the feasibility of conducting trials. In populations being considered for trials, candidate vaccines should be tested first for safety and immunogenicity in the target age group.

S. pneumoniae appears to be the most important pathogen causing severe ALRI, although multiple serotypes are involved. A second field trial in a developing country (Gambia) of the available polysaccharide vaccine is being planned. It is imperative that any new pneumococcal conjugate vaccine incorporates serotypes relevant to young children in developing countries.

Promising H. influenzae type b conjugate vaccines exist, but it is not clear how much disease is caused by this organism in developing countries. Once this is known, an efficacy

study of the most promising vaccines should be undertaken in a developing country. Vaccines for non-typeable H. influenzae are in the early developmental stages and are not likely to be available soon.

6. REVISED 1988-1989 BUDGET AND PROPOSED PROGRAMME BUDGET FOR 1990-1991

The TAG reviewed revised estimates for the financial period 1988-1989, which had been prepared taking into consideration actual obligations for 1988 and revised estimates of activities in 1989. It noted that the revised budget, amounting to US\$5 980 000 for the biennium, represents an 8.7% decrease compared with the original estimates, which had assumed a more rapid development of recommendations and guidelines for programmes than had in fact been the case.

The TAG also examined the proposed programme budget for 1990-1991, which totals US\$9 107 000. It noted that this budget represents a 52% increase over the 1988-1989 biennium, which is distributed over the health services and research components. It is envisaged that the developmental activities started in the previous biennium will continue, but that more emphasis will be given to the implementation and expansion of national control programmes. Emphasis will also be given to the support of priority research topics.

7. CONCLUSIONS AND RECOMMENDATIONS

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

7.1 Objectives and strategies

7.1.1 The reduction of childhood mortality is one of the top priorities in the health programmes of developing countries. Pneumonia is consistently one of the three main causes of death in infants and young children. The TAG emphasizes, therefore, that reduction of mortality from pneumonia should be the primary objective of the Programme. Additional secondary objectives should be: (1) reduction of the inappropriate use of antimicrobials and other drugs for the treatment of ARI in children, (2) prevention of acute lower respiratory infections, and (3) reduction of the severity of and complications from acute upper respiratory infections.

7.1.2 The TAG reaffirms that appropriate case management should be the central control strategy of the ARI Programme. Intervention studies supported by the Programme in several developing countries have provided further evidence showing that proper case management can contribute greatly to reducing child mortality.

7.1.3 The TAG recognizes that immunization against measles and pertussis is an important means of preventing pneumonia. It stresses the need to support initiatives to analyse available information on the effectiveness, feasibility, and cost of other preventive interventions for ARI programmes.

7.2 Health services component

7.2.1 Planning

7.2.1.1 Recognizing that it is not usually feasible to implement a national ARI programme simultaneously throughout a country, the TAG recommends that programmes be implemented in a phased manner. Geographical areas that are representative of the varying conditions in a country can be chosen to gain experience and make appropriate improvements and adaptations in the implementation process. A time-frame for extending the programme throughout the entire country should be formulated during the planning process. While the TAG endorses a sequential approach to planning the access to and use of services, it urges that flexibility be encouraged in the timing of successive stages of the programme depending on a country's development policies, health infrastructure, and the availability of material resources and personnel.

7.2.1.2 The TAG suggests that, within each geographical area (a region or a province), the programme should ensure access to correct standard case management for ARI in first-level health facilities and at first referral levels within the health system. Full access for the population will, however, usually require the involvement of community-based health providers, such as CHWs, traditional healers, and birth attendants. When possible, priority should be given to segments of the population that are at greatest risk for pneumonia.

7.2.1.3 Once the entire health system is in a position to offer standard case management through trained personnel and a regular supply of drugs, a systematic process should be developed to promote demand by educating all families through all appropriate channels.

7.2.1.4 The ARI programme should be fully integrated into the health care system at the community and district levels. The TAG stresses, however, that the programme needs to be headed by a full or part-time programme manager at the central level to ensure proper planning, implementation, and evaluation of control activities. Coordination with other components of primary health care and with the activities of donors, NGOs, and the private sector should be sought whenever possible.

7.2.1.5 The TAG emphasizes that paediatricians and the medical profession in general should be associated from the beginning with the planning process, in particular with the formulation and adaptation of technical policies and guidelines on case management. The WHO Programme should provide guidance to country programmes on ways of fostering contact with and enlisting the support of the medical profession.

7.2.2 Technical policies

7.2.2.1 Having reviewed the modifications and additions that the Programme has introduced in the case management guidelines, based on recent research and field experience, the TAG welcomes the new emphasis given to the diagnosis and treatment of pneumonia and sepsis in the extended neonatal period and the plan to prepare guidelines for the management of pneumonia in severely malnourished children.

7.2.2.2 The TAG recognizes that the case management of ARI is relatively complex due to the large number of conditions of different etiology and the many clinical manifestations. It commends the Programme for achieving the difficult task of condensing the key elements of the clinical protocol in a simplified Treatment Chart. Although some technical refinements may still be necessary, e.g., in the management of severe cases, as a result of Programme experience and research findings, the TAG considers that the Chart has been optimally shaped as a practical job-aid for first-level health facilities. It realizes that it may need to be modified to meet local circumstances and capabilities.

7.2.2.3 The core of the case management strategy is the early identification and treatment of pneumonia. Thus, at community level, the case management protocol should be focused mainly on the early diagnosis of pneumonia using a few objective signs. At the first-level health facility, the protocol could include, in addition, diagnostic indicators for ear and throat infections and wheeze. The specific conditions covered will depend on the capabilities of the staff and the resources available. The TAG notes with satisfaction the modular, graphical presentation of the Treatment Chart, which facilitates its adjustment to the varying complexities of case management.

7.2.2.4 The WHO guidelines recommend that severe cases of pneumonia be referred to hospital for treatment with injectable antimicrobials and, in some cases, with oxygen. It is recognized, however, that referral is not always feasible in rural areas of developing countries. The TAG stresses the need to include in the WHO guidelines the most practical and useful information for the management of severe pneumonia under these circumstances.

7.2.3 Operations

7.2.3.1 The TAG recognizes that the Programme has greater intrinsic complexity than either the EPI or the CDD Programme: services must be continuously available because of the rapid progression to death, the diagnostic criteria require special training, and the antimicrobials used in treatment demand precision in their administration and care to prevent overuse. These facts should be recognized in the planning and implementation of ARI programmes.

7.2.3.2 The TAG emphasizes that, more than most programmes, ARI requires reliable logistical arrangements to ensure the provision of adequate and regular supplies of antimicrobials to all service levels. A distribution system that is able to deliver supplies regularly to the periphery is essential because pneumonia cases often die within 3-5 days after onset of illness. The drugs for ARI should be provided as part of a well-functioning essential drug delivery system. Support from UNICEF in supplying antimicrobials and other supplies, especially in the early stages of programmes, would be welcome.

7.2.3.3 The TAG notes the problem caused by the fact that antimicrobials provided for the treatment of ARI in children are used to treat other infections, such as sexually transmitted diseases. Also, mothers may not complete a full course of treatment if the child's condition seems to have improved. For both of these reasons, it is recommended that the most commonly used first-line drug (co-trimoxazole) be provided in paediatric doses with a clear indication on the package that it is for a five-day course of treatment. It could be labelled as a children's pill for pneumonia.

7.2.3.4 The TAG encourages coordination with other donors in standardizing the packaging, labelling, and doses of antimicrobials for the treatment of ARI in children.

7.2.3.5 The TAG emphasizes the high priority that will have to be given to supervision to ensure effective implementation. There will be a greater need for consistent technical supervision in programmes that rely on community involvement and CHWs because of the demand in the community for antibiotics for various health problems.

7.2.4 Training

7.2.4.1 The TAG places high priority on the provision of training courses for programme managers. Those selected to attend such courses should be individuals responsible for programme implementation at the national and provincial levels. A major part of this training should be in the methodology of planning, management, and evaluation. An immediate need is to finalize the training materials for this course.

7.2.4.2 The TAG feels that the training of staff at all levels in ARI case management is an essential component of ARI programmes. Short courses of up to one week will cause a minimal disruption in routine work. If possible, the training should be provided close to the site of the participants' work and should include various members of the health team. Training should be practical, involving the actual care of cases. Participants should also learn realistic approaches to solving problems such as helping mothers to recognize the early signs of pneumonia and obtaining their compliance in completing treatment. A major effort will be needed to prepare prototype training materials that can be adapted for local use.

7.2.4.3 The TAG encourages the development of ARI Training Units (ATUs). The first units should be established at regional and national level; training should then be extended to the district level. ATUs should be located in facilities where many cases of pneumonia are seen so that trainees can be given practical experience in diagnosis and care. They can also be used as effective means of advocacy and publicity.

7.2.4.4 The TAG urges that training programmes include regular opportunities for periodic retraining and in-service refresher courses. Such training will be most needed for workers in remote areas.

7.2.4.5 The TAG recognizes that, for national programmes to be sustainable, up-to-date information about ARI has to be included in the basic training of new health personnel. This will be especially needed in medical and nursing schools, and will require reorientation of the teaching faculty through seminars and presentations at professional meetings. Such activities should also reach teachers in schools for other health workers and private practitioners. Seminars organized by paediatric societies for their members should assist in promoting the active involvement of paediatricians in the programme. A systematic effort should be made in teaching activities to promote the judicious use of antibiotics for respiratory infections.

7.2.5 Communication

7.2.5.1 The TAG recognizes that the first step in the system for providing improved case management for ARI in children is to help mothers and other family members to recognize the danger signs that should lead them to seek care. This requires well-designed communication with mothers through channels that they trust. It must be based on an understanding of local beliefs and traditional perspectives on causality, and preferences for patterns of care.

7.2.5.2 The TAG stresses the importance of face-to-face communication between health personnel and community workers and local opinion leaders as an initial step in producing change in care-seeking behaviour. The first stage in communication should be to reach local agents of change and people to whom parents turn for advice on health care.

7.2.5.3 The TAG recognizes the potentially equal importance of the use of mass media channels for public education about ARI treatment. The timing of such messages must, however, be carefully adjusted to start only when services are actually available. If demand is created before supply is available and staff are trained, there can be repercussions that will set back the development of the programme.

7.2.5.4 For long-term ARI control, the TAG suggests that the Programme explore whether public education could be used for preventive interventions. Such activities should be considered when more is known about the causal factors influencing pneumonia morbidity and the feasibility of influencing these factors.

7.2.6 Evaluation

7.2.6.1 An early priority for an ARI programme is to establish an information system that will facilitate programme monitoring and evaluation. Because the existing data collection system in health facilities is usually overloaded, only a few key items of information should be collected. A suggested approach is to collect data from health facilities on services provided, the availability of drugs, and utilization patterns, and information on ARI treatment by all sources of care through community surveys in areas where the programme has been implemented. This information can guide the nationwide extension of the programme. The TAG recommends that only a few indicators of services and programme performance be used and requests the Programme to formulate these for application in countries.

7.2.6.2 All programmes should plan to monitor the quality of activities and measure progress towards their objectives and targets. In view of the great importance of obtaining data on programme achievements, the TAG attaches high priority to the development of the planned guidelines and survey methods.

7.2.6.3 The TAG acknowledges the serious constraints of morbidity surveys for measuring the incidence of pneumonia, and of mortality surveys for measuring deaths from ALRI. It urges that studies be conducted to find feasible techniques to overcome these problems. In the meantime, emphasis should be placed on surveys to measure correct ARI case management in the home and at health facilities.

7.2.6.4 The TAG welcomes the plan to prepare guidelines for surveys of the knowledge, beliefs, and practices of families relevant to ARI in children as a basis for promoting early recognition of pneumonia and care-seeking, and evaluating health education activities.

7.2.6.5 Of logical concern to the ARI Programme is the emergence of bacterial resistance to the standard antimicrobial treatment. The TAG notes the difficulties faced by the Programme in setting up a global surveillance system and endorses the decision to focus efforts on strengthening national capability to monitor antimicrobial resistance. It notes the research that is being carried out to simplify surveillance methods and the plan to prepare a manual describing recommended epidemiological and laboratory methods for surveillance.

7.3 Research component

7.3.1 Introduction

7.3.1.1 The TAG recognizes the substantial effort that was required of both investigators and the Programme to conduct intervention studies to evaluate the impact of the case management strategy on childhood mortality. It notes with satisfaction the impact demonstrated in some of these studies. The TAG urges that additional information of direct relevance to the case management strategy be derived from them by further analysis of existing data and by continuation of the intervention research in selected sites (e.g., Jumla, Bohol).

7.3.1.2 The TAG appreciates the Programme's efforts to define and focus research activities, and welcomes the opportunity to review the document "Biomedical and epidemiological research priorities of the global Scientific Working Group" and hear the presentation by the Programme about the revised priorities. It requests that the Programme consider on a more limited number of focused priorities, as recommended hereunder, and prepare a new document reflecting the revised priorities.

7.3.1.3 The TAG considers that, as a first priority, the research supported by the Programme should address the important questions that remain with regard to delivery of the case management strategy. Such research falls in the areas of case management and health systems. The TAG feels that, as a second priority, the Programme should engage in a limited way in the evaluation of vaccines that have potential for the control of pneumonia.

7.3.1.4 The TAG is aware of the difficulty of identifying investigators with an interest in undertaking studies on priority subjects. Although it realizes that the initiation of research activities will necessarily be gradual, it is confident that the Programme will be able to identify and collaborate with researchers in the needed studies.

7.3.2 Research priorities

7.3.2.1 Case management research

The term "case management research" is used here to cover a group of research issues related to the management of clinical problems in pneumonia and sepsis. For some of these issues there is currently little information available. The TAG emphasizes the importance of addressing these issues in the community and in first-level and referral facilities, through studies carried out in a number of different sites.

7.3.2.1.1 The TAG identifies pneumonia and sepsis in the extended neonatal period as being among the highest priority areas for research. It emphasizes the need for studies to determine the microbial etiologies and assess the value of clinical symptoms and signs in predicting the presence of pneumonia or sepsis.

7.3.2.1.2 The TAG recognizes that the Programme's guidelines for the treatment of pneumonia in the age group 2 months to 4 years reflect the current state of knowledge in this area based on expert opinion and a limited number of clinical studies. It considers

that research relating clinical signs and symptoms to specific outcomes, such as radiologically confirmed pneumonia or measures of severity of pneumonia, should be pursued as a high priority to strengthen the basis for current recommendations.

7.3.2.1.3 The TAG emphasizes the importance of behavioural research and its relevance to many aspects of case management. It recommends that the highest priority be given to studies in this area, in both neonates and older children. Such studies would include a description of the methods used by caretakers to detect severe illness, child care practices in the home, reasons for delayed care-seeking, and compliance with recommended treatment regimens.

7.3.2.1.4 The TAG notes with satisfaction that studies to determine whether health workers are able to count the respiratory rate accurately and recognize other signs of pneumonia and neonatal sepsis are to be developed in the near future. It affirms that such studies are of highest priority for programme implementation.

7.3.2.1.5 The TAG recognizes the importance of establishing the efficacy of recommended antibiotic regimens, particularly in high-risk groups such as neonates and severely malnourished children. It notes that such studies in neonates may have to follow an initial evaluation of the pharmacodynamics and safety of the antibiotics being considered. It considers the above studies to be of primary interest, and evaluations of simplified or shortened schedules, or the relative efficacy of alternative antibiotics, to be important but of lower priority.

7.3.2.1.6 The TAG feels that research to estimate directly the mortality reduction attributable to the provision of oxygen at referral facilities may not be possible; on the other hand, a series of pulse oximetry studies to estimate the prevalence of severe hypoxia among children with pneumonia would be important to guide national programmes in the use of oxygen.

7.3.2.1.7 The TAG considers that the initial efforts of the Programme to standardize methods of radiological interpretation and assessments of pulse oximetry are worthwhile and will facilitate comparisons between studies.

7.3.2.1.8 The TAG welcomes the efforts being made by the Programme to standardize the methodology for assessments of antibiotic sensitivity. Such surveillance activities will be essential to guide recommendations on the use of specific antibiotics.

7.3.2.1.9 The TAG recognizes the importance of research into the efficacy of co-trimoxazole as an antimalarial agent and awaits with interest the results of the studies that are currently being supported by other agencies.

7.3.2.2 Health systems research

The TAG realizes that a number of important health systems research issues have become apparent following the initial implementation of national ARI programmes. These concern the feasibility and efficiency in practice of appropriate technologies, training of health workers, strategies to promote early recognition of pneumonia and early care-seeking behaviour, and methods of assessing programme performance. It feels that some of these issues may be most appropriately addressed within the services component of the Programme, while others may require a more detailed research effort. It considers that the latter must be carried out within a national programme that is being implemented in a realistic manner, and that therefore will require close collaboration between the Programme's services and research staff on the one hand, and between Programme staff and those implementing ARI activities at the country level on the other.

7.3.2.2.1 The TAG recognizes the importance of studies to evaluate programme effectiveness and cost. Correct performance of ARI programmes in terms of their ability to deliver the

recommended case management guidelines is considered to be a suitable indicator of effectiveness. While assessments of mortality and other health outcomes are also of value, they may be possible in only a few national programmes.

7.3.2.2.2 The TAG sees a need for research to define effective communication strategies to improve early recognition of pneumonia and neonatal sepsis and encourage early care-seeking behaviour. These studies will become a high priority after the completion of those outlined in paragraph 7.3.2.1.3.

7.3.2.2.3 The TAG endorses the efforts of the Programme to develop and evaluate the use in ongoing national programmes of appropriate technologies such as simple timing devices, robust oxygen concentrators, durable otoscopes, and foot-pump nebulisers.

7.3.2.2.4 The TAG highlights the importance of adequate distribution of antibiotics and other drugs to the periphery of the health system and appropriate use of drugs in the management of ARI. It recommends that the Programme should support research on the latter and encourage the Action Programme on Essential Drugs to continue working actively in the area of drug availability and distribution.

7.3.2.2.5 The TAG requests the Programme to continue to identify similar health systems research issues by monitoring carefully the problems facing national ARI programmes.

7.3.2.3 Disease prevention research

7.3.2.3.1 The TAG recognizes the general importance of certain risk factors of a biological (e.g., low birth weight and malnutrition) or environmental (e.g., air pollution from biomass fuel consumption) nature and the possible role of selected behavioural risk factors in determining pneumonia incidence and severity. However, it feels that studies of the risk factors for pneumonia are unlikely to yield results that would be useful to the Programme at the present time. This is because some of the risk factors, such as nutritional problems or inadequate breast-feeding, are already of recognized importance for other reasons and in general lend themselves to intervention, while others, even if they are found to be significant, would not be amenable to intervention. The TAG recommends that, in the area of risk factor intervention research, high priority should be accorded only to assessments of the impact on pneumonia incidence of periodic prophylaxis with high doses of vitamin A in areas where vitamin A deficiency is prevalent.

7.3.2.3.2 The TAG endorses the initial selection of invasive disease due to H. influenzae and S. pneumoniae as the prime target for vaccine development and evaluation. It calls attention to the important role that WHO can play in providing technical and policy leadership in evaluating the suitability of vaccines against these diseases for use in developing countries. It also emphasizes that, while the Programme may be unable to fully fund large-scale vaccine field trials with its available or anticipated resources, it has a role to play in guiding vaccine-related research on these two diseases.

7.3.2.3.3 The TAG supports the efforts of the Programme to initiate a limited number of studies in order to have appropriate methods and a field area ready for an efficacy study of an H. influenzae type b vaccine in one to two years time. To evaluate the efficacy of this vaccine it is first necessary to establish case definitions for use in field trials. Accordingly, one or two studies should be done to determine the frequency of H. influenzae bacteraemia and pneumonia, using specific culture methods. Following such studies, a descriptive investigation should be conducted in a potential vaccine trial area to assess the incidence, at health-facility level, of H. influenzae disease documented by culture.

7.3.2.3.4 The TAG recognizes that promising candidate vaccines against H. influenzae type b are now available which may be suitable for evaluation in field trials in developing countries in the near future. If, on further consideration, these vaccines meet the expectations of compatibility with the EPI schedule, low cost, and high immunogenicity in the target population of young infants, it is expected that the Programme will play a role in designing and supporting such trials.

7.3.3 Research management

7.3.3.1 The TAG notes that the Programme proposes to fund some research through a Scientific Working Group and some by more direct contractual arrangements. It appreciates the reasons for this, but wonders whether it might not be preferable to utilize a number of small task forces to help guide specific elements of the research. Once a decision on the funding mechanisms has been made, procedural guidelines should be prepared.

7.3.3.2 The TAG recognizes that Programme staff and outside consultants will need to spend a considerable amount of time and effort on identifying investigators and assisting in the design and implementation of research in priority areas. It also notes the value of identifying multidisciplinary groups of investigators at selected institutions and of providing support to these groups to enhance their ability to carry out priority research. Thus, the Programme may wish to consider providing limited research support funds to a small number of institutions in the near future. The experience of CDD in this area may be of use to ARI.

7.3.3.3 The TAG recognizes the important role that the Secretariat can play in the development and management of research projects and expresses concern at the limited number of staff available for this task, given the important research agenda to be accomplished. It anticipates that consultants may need to be used extensively, at least in the early stages of research development, and that the Programme may need to increase the staff working in this area in the future.

7.3.3.4 The TAG feels that the funds available for research in 1989 are adequate, but that the amount allocated for research contracts in the proposed 1990-1991 programme budget is insufficient to support even the high-priority research activities. It estimates that about US\$1.5 million will be required for contracts during the biennium, representing an additional US\$450 000.

7.3.3.5 The TAG recommends that the research outlined in paragraphs 7.3.2.1.1 to 7.3.2.1.4 be accorded highest priority, since the results of these studies will provide the information needed to improve the case management approach. Furthermore, it feels that steps should be taken to establish a plan and initial activities for the evaluation of programme effectiveness (paragraph 7.3.2.2.1), since this is critical to establish the feasibility and effectiveness of the case management strategy.

7.4 Budgetary matters

7.4.1 The TAG approves the revised budget for 1988-1989. It notes that the Programme obligated approximately 25% of its budget during 1988, and carried over the remainder into 1989. It notes that many activities have developed more slowly than was originally anticipated, but that more rapid development is expected in 1989, when it is anticipated that the full budget will be required.

7.4.2 The TAG approves the proposed programme budget for the 1990-1991 biennium, which represents a 52% increase over that for 1988-1989, believing that it is the minimum required for the planned activities. It notes that there will be a significant increase in activities at the country level and in research.

7.4.3 While it approves the 1990-1991 budget, the TAG feels that it may provide insufficient support for research activities. It recommends that a revision of the budget be considered by the Programme, in consultation with the TAG Chairman, based on the TAG's guidance with respect to research priorities (section 7.3). Such a revision may require significant increases for research.

7.4.4 The TAG recommends that efforts be pursued to secure the necessary financial support from the donor community and to increase, if possible, the allocations from the regular budget of WHO. The TAG recommends that the Programme develop a plan for budget reductions for presentation to the donor community in the event of a shortfall in funds.

8. NEXT MEETING OF THE TECHNICAL ADVISORY GROUP

The TAG agreed to hold its next meeting on 11-15 March 1991 at WHO headquarters in Geneva.

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