

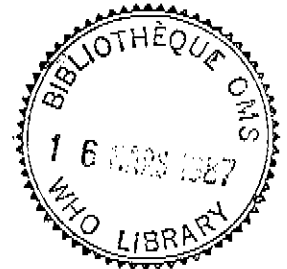


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ACUTE RESPIRATORY INFECTIONS  
PROGRESS AND CURRENT STATUS OF THE PROGRAMME  
SECOND REPORT  
1985-1986

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Executive Summary  
1985-1986

The programme on acute respiratory infections (ARI) was officially established in 1982 upon adoption by the World Health Assembly of the Seventh General Programme of Work. Since its inception the programme has had as its major purpose the prevention and control of ARI mortality in young children of the developing world, where it is often the leading cause of death. Since the intent was to develop control strategies as quickly as possible, targeted research was carried out initially to identify methods appropriate for case management in the context of primary health care. These efforts were completed at the start of the present period. Now the programme has moved into a second phase, in which three components have been identified: health services, research, and promotion and information dissemination. The health services component first established the basic procedures to be used in case management. A consensus meeting was held among a group of leading paediatricians from the developed and developing worlds to refine these procedures. The programme is now moving into the implementation stage. Managerial tools have been developed, with the help of a number of experts in the field. Methods for monitoring and evaluating the activities have also been developed. Implementation is moving forward at different rates in different parts of the world. Brazil and other areas in Latin America are currently putting the programme into effect, while in other regions seminars and training programmes are being organized. Initial estimates confirm the low costs of the programme; this is especially the case in regions where inappropriate use of antibiotics is currently prevalent.

Research was initially focused on critical issues in case management. Recent research has mainly been operational in nature, directed toward determining the effect of the programme and its feasibility. Studies have been conducted in 10 countries and two have been concluded. Results are currently being prepared for dissemination. In India, a comparison of an area in which the programme was implemented with a control area demonstrated a decrease by two-thirds in ARI-specific fatality. Other types of studies addressing issues of diagnostic criteria and specific etiology are in the developmental stage.

To disseminate information and current developments to the field, a Newsletter, "ARI News" has been produced. Other methods of promotion to the scientific, managerial and lay communities have been established. The budget has risen to \$ 2 155 140 in combined budgetary and committed extrabudgetary funds for the current biennium 1986-1987. While the regular budget component has risen, the extrabudgetary component has not as yet.

PROGRAMME OF ACUTE RESPIRATORY INFECTIONS  
PROGRESS AND CURRENT STATUS OF THE ARI PROGRAMME  
SECOND REPORT 1985-1986

1. Introduction

The present report describes the activities undertaken by the WHO's programme on acute respiratory infections in the period 1985-1986, from a global perspective.

The overall purpose of the programme is to prevent and control acute respiratory infections in children. In the short term the objective is to reduce the mortality from ARI in children in developing countries through effective case management at various levels of primary health care. In the long term it is to control the considerable health problem caused by acute respiratory infections in children in all countries through prevention of severe respiratory infections and reduction of morbidity.

Although the intention to build up an ARI programme goes back to 1978, it was not officially established until 1982 when the World Health Assembly adopted Resolution 32.25 approving the Seventh General Programme of Work covering the period 1984-1989. As a result ARI was then for the first time recognized as a distinct programme of Health Science and Technology at the same level as other Communicable Disease Prevention and Control Programmes such as the Expanded Programme of Immunization and the Control of Diarrhoeal Diseases.

Soon after the WHA Resolution, a Technical Advisory Group was established by the Director-General to advise the WHO Secretariat on programme priorities and to provide an independent view of the contents and scope of the programme. In its first meeting in March 1983, the Group came to the conclusion that enough knowledge and technology was available to initiate an ARI control programme primarily addressed to reducing mortality in children(1). The report stressed the need to start in a phased manner with the introduction of simple measures of case management and health education at the primary health care level, the progressive strengthening of technical support at the higher levels and the monitoring of deaths. Accordingly, health systems research was given the first priority, but clinical, etiological and epidemiological studies were also initiated.

The progress made in the years 1983 and 1984 was reviewed by the Technical Advisory Group in the second meeting which took place in March 1985(2). The Group acknowledged that the programme had advanced enough in the collection of critical information and the preparation of managerial tools for control programmes. It was considered high time to shift the emphasis from health systems research to effective programme implementation (3). Research, however, remained essential to improve the control strategies and the functioning of the national programmes.

2. Programme planning

A Medium Term Programme on Acute Respiratory Infections for the years 1984-1989 was formulated in 1983 with the participation of the six WHO Regional Offices (4).

The programme activities were aimed at fostering national and international action so that by 1985 a strategy for intervention at the community level would have been developed, and by 1989 most developing countries would have formulated national programmes for the control of acute respiratory infections. The Medium Term Programme presented the activities in the sequence needed to achieve these targets:

- (a) Development of intervention strategies and supporting research
- (b) Formulation of the national ARI strategy within primary health care
- (c) Development of manpower expertise.

The activities up to this point here mostly have been concentrated on step (a). Having established the groundwork, the programme can proceed to the steps (b) and (c). This implies a vast expansion of the activities and the resources.

Owing to the wide diversity of issues involved in acute respiratory infections, inputs from various disciplines were essential to develop the control strategy and the managerial materials. The cooperation with related WHO programmes and other institutions has been extensive from the beginning. Reference will be made below under the description of the activities to the various kinds of collaborative work.

Whatever the stage in programme development, three major components can be identified: the health service component, concerned with application of the present state of the art to the prevention and treatment of ARI in children; the research component directed to strengthening the scientific basis of the programme and solving problems raised in the implementation of services; and the promotion component aimed at ensuring the necessary commitment of resources, and professional and public support.

### 3. Health Services Component

#### 3.1. Control Strategies

A prerequisite of primary health care is the use of technologies which are appropriate for village level care, namely those which people can understand and accept and which nonmedical personnel can apply. In ARI three control technologies which offer immediate potential benefits for children in developing countries were identified as both scientifically sound and socially acceptable: immunization, health education and case management.

At the start of an ARI programme in a country priority has to be given to the strengthening of the expanded programme of immunization since four of its vaccines are addressed to prevent mortality and morbidity from respiratory infections: measles, pertussis, diphtheria and childhood tuberculosis. Deaths from these diseases, mainly pertussis and post-measles pneumonia, contribute up to 25% of the total ARI-associated mortality. Nevertheless, this means that 75% of these deaths cannot be prevented with the currently recommended vaccines for children in developing countries. New, effective, safe and inexpensive vaccines are being developed and tested against the most frequent agents of acute lower respiratory infections. Until the new vaccines may become part of the expanded programme of immunization, and are widely applied, health education and case management can make substantial contribution to the reduction of the ARI mortality.

Health education is an essential element of primary health care. The proper clinical management of a child with pneumonia is reasonably established. But no life can be saved if the sick child is brought for care too late or not brought at all. Teaching parents to recognize the signs of pneumonia in children with coughs or colds is one of the most crucial tasks facing health workers. It is equally important that parents understand when a child does not need outside help and when simple supportive care in the house is all that is needed. Health education should also address protecting the children against chilling and reducing indoor air pollution. Education on general measures of maternal and child health, such as antenatal care aimed at increasing the birth weight of the newborn and promoting breast-feeding and proper nutrition, will also contribute to the prevention of severe morbidity and mortality from ARI.

Case management remains the central strategy of the control approach because in the short term it can significantly reduce ARI-associated mortality and case fatality. Recent developments have strengthened the evidence of the effectiveness of case management:

- (a) In developing countries bacteria play a far greater role as agents of pneumonia than currently in developed countries. Only two microorganisms are responsible for the great majority of community acquired, severe cases of bacterial pneumonia, i.e. Streptococcus pneumoniae and Haemophilus influenzae (5).
- (b) A simple protocol for discrimination and treatment of pneumonia has been developed on the basis of the field experience of the WHO Collaborating Centres of Goroka, Papua New Guinea, and Chandigarh, India (6). Tests done in primary health care settings demonstrated that the protocol is simple enough to be understood and applied by community health workers. Three clinical signs which are objective, discriminatory and easy to observe constitute the core of the management of an ill child with cough, namely, inability to drink, chest indrawing and fast breathing. They provide the guidance to decide whether or not to refer a child with ARI to a higher care level, and if not, whether to give antimicrobials or only supportive measures.
- (c) Low birth weight was found to be associated with up to 80% of ARI-related infant deaths. The incidence of low birth weight is quite high in developing countries. In many places it varies from 20 percent to 40 percent of newborns. But even as regards this condition, a controlled programme of case management and health education in a rural area of Ambala District (Haryana) near Chandigarh, India, indicated that the ARI case fatality was reduced by two thirds in the intervention villages in those with low birth weight in comparison with the control villages.(7).

### 3.2. Development of managerial tools

#### (a) Technical guidelines

There was no better indication of the widespread neglect of ARI in developing countries than the almost complete lack of guidance on how to deal with the children with cough and other respiratory symptoms who overcrowd the health services during the winter or rainy seasons. Therefore, the production of technical guidelines and training material

on case management and health education was considered a priority from the beginning. Both guides and training modules have been developed simultaneously because of the need to issue entirely consistent documents: on one side the guides had to come down to specify even the minor details required to train non-medical personnel; on the other hand the training module had to express exactly the technical content of the guides. It did not take long to realize that this was an area in which new ways had to be opened and worked out. Previous efforts were of little value since in general the available case management protocols had been devised by specialized centres for use of the medical profession with the support of radiology and laboratory services.

A working group of pediatricians and epidemiologists experienced in ARI in children in developing countries was constituted in March 1984. Expertise in instructional systems was provided by CDC's Centre for Professional Development and Training, Atlanta, which had collaborated in the elaboration of the training material of the WHO programmes on immunization and diarrhoeal diseases. The first step was to analyse the ARI programme goals and strategies; this was followed by the specification of the tasks to be performed and the training needs at different levels of the primary health care system, on:

- i - discrimination of cases into mild, moderate and severe ARI based on the classification of symptoms and signs
- ii - supportive measures
- iii - antimicrobial treatment
- iv - referral criteria
- v - family and community health education.

The process took longer than originally anticipated because of the difficulties involved in translating the complexities of the various respiratory syndromes into a simple protocol for use of the community health worker. The apparent failure of similar efforts in the past was well understood during the analysis of a large number of practical questions and small but important details on an efficient case management of ARI. A remarkable consensus was reached by the working group on the essential elements of the simplified protocol for case management. Field tests were made to ascertain its applicability under different situations in developing countries.

Two technical guidelines were completed and printed:

- a. 1) Case management of acute respiratory infections in children in developing countries.

Document WHO/RSD/85.15.Rev 2. Available in English, French and Spanish (8).

This guide, issued in 1985 and revised in 1986, provides the rationale for the standardization of case management and an action-oriented classification of ARI in children:

- cases that require hospitalization (severe forms),
- cases that can be managed as outpatients, but for whom treatment with antimicrobials is indicated (moderate forms),

- cases for whom only supportive measures without antimicrobial treatment are indicated (mild forms)

Taking into account the different capabilities of health workers and the different facilities available at the various levels of the health system, three plans of increasing complexity are proposed:

- for the community health worker who normally has less than six months of formal training,
- for the first level health facility staffed with workers with six months to two years of formal training,
- for first referral health facilities usually staffed with technical personnel formally trained for three to six years (including general medical practitioners).

The guide gives information on the most useful simple supportive measures and reviews the advantages and disadvantages of the most commonly used antimicrobials. It proposes a non-antimicrobial policy for most acute respiratory infections. The use of antimicrobial is very selective, restricted only to children suffering from infections which are most likely caused by bacteria, namely those with signs of pneumonia, otitis media and purulent pharyngitis with large and tender lymph nodes in the neck.

- a.2) Respiratory Infections in Children: Management at Small Hospitals Background notes and a Manual for Doctors. Document WHO/RSD/86.26. Available in English and Spanish. French translation in preparation (9). The Spanish version has been published by the Pan American Health and Education Foundation within the Latin American Textbook Programme, it has been distributed among all health sciences schools of the Region.

This document has two parts. The first part is entitled The Background Notes. In it the main features and the criteria for clinical decision of the protocol for the management of ARI are discussed. It provides the information on which each recommendation is based and the corresponding references. Since the protocol proposed changes in long-rooted habits in the medical practice, for example the overuse of antibiotics, antipyretics and cough medicines, it was considered of the utmost importance to provide the best scientific evidence to guide the health workers in the management of ARI. The other part, entitled Manual, is a handbook for the day-to-day work of doctors in hospitals where X-Ray and microbiology facilities are limited or non-existent. In a concise way it indicates how to proceed with children presenting the most common respiratory syndromes such as cough with fast breathing, chest indrawing, wheeze, stridor, chronic cough, tuberculosis, whooping cough and upper respiratory tract infections, including otitis media. The Manual will be published as a separate booklet, pocket size, so that it can be easily taken by the doctor in his white coat.

(b) Training material

Two training modules were produced:  
Management of the child with cough, and  
Management of the child with ear, nose and throat infection

They are available in English, French and Spanish. The French translation was undertaken under a contract with WHO by the International Children's Centre, Paris, where the translator worked closely with pediatricians with

international experience to ensure use of the most appropriate terminology in acute respiratory infections for French-speaking countries outside of Europe. For the same reasons the Spanish translation was done by the Pan American Health Organization in Washington.

In a separate booklet the guidelines for Course Facilitators were printed. Although the modules were designed as self-learning material, the active training methodology requires the guidance of course facilitators to assist the participants during the training sessions.

The modules are addressed to mid-level supervisors in charge of training and supervising the personnel of peripheral health services and community health workers. They are similar in format and type of exercises to the EPI and CDD modules and can be easily integrated into the Supervisory Skills Courses of these programmes since the same staff will be responsible for the execution of the three programmes. ARI courses can be organized independently if there is a need to train only in this programme because it has come after many years of training in EPI and CDD activities.

A great deal of work was accomplished through the development of the training modules and the building of consensus among technical experts on the specification in the protocols. The modules contain not only the steps in the management of children with ARI but also the main educational messages that the programme is committed to transmit to the community.

Before printing three field tests of the material were organized in conjunction with EPI and CDD regular training programmes. The purposes were to check that the technical content was accurate, that no contradictions were present, that obvious technical points were dealt with and that everything included was practical and feasible. The test courses were conducted in Colombo, Sri Lanka, 15-23 July 1985 ( 19 national participants), in Chandigarh, India, 18-30 October 1985, ( 22 national participants) and Bridgetown, Barbados, 1-20 November 1985 (25 participants from the Caribbean countries). The participants of the Colombo and Chandigarh courses were mostly doctors with responsibilities in the supervision of medical and paramedical staff. In contrast, in the Barbados course all the participants were senior nurses. The courses were complemented with a clinical visit to a hospital where the participants had to apply the taught skills in assessing children with acute respiratory infections and deciding on their treatment. The visit to the hospital was of great importance for the evaluation of the modules. The modules were also tested in Spanish in several courses in Latin America.

The three test courses raised a considerable number of points which required further refinement and, in some cases, substantial changes in the material. The final revision to incorporate the necessary modifications into the modules took place in a meeting of the working group at CDC, Atlanta, 10-13 November 1985. In March 1986 the modules and accompanying instructional material were ready for the printers and the translators into the other languages.

#### (c) Operational Manual

Once an advanced stage had been reached in the preparation of the technical guides and training material, the next priority was the elaboration of an operational manual on the specific ARI elements to be incorporated in the planning, implementation and evaluation of primary health care programmes. The first draft was written in 1985 on the basis of experience in

Brazil, where the efforts to implement an ARI programme based on case management and health education went back to 1982. Later the draft was reviewed by several experts with background in ARI programmes in Latin America, in child survival programmes in Africa and in ARI pilot projects in South East Asia and the Western Pacific.

The Manual has been published in English under the title, "Acute Respiratory Infections: A Guide for the Planning, Implementation, and Evaluation of Control Programmes within Primary Health Care" (Document WHO/RSD/86.29). The French and Spanish translations will be available during 1987. The manual provides only a framework which requires adaptation to suit existing situations in each country. It is a reference document about the steps of the ARI programme process: describe and analyse the problem in children under 5, review current health policy and existing legislation, set objectives and targets, determine programme strategies, design and schedule implementation activities: promotion, budget, training, monitoring, supervision and evaluation.(10).

Together with the Manual a set of exercises can be provided to be used in workshops for programme managers. The solution of the exercises is based on the information contained in the Manual. The titles of the exercises are: Planning a National ARI Programme Setting the Objectives and Targets, Calculating Drug Needs, Designing a Check list for Supervisory Visits, Evaluating the Programme's Impact on Mortality and Designing a Plan of Operation.

(d) Audiovisual aids for training and health education

Although local circumstances vary widely, the main approaches to case management and health education are applicable to almost all developing countries with high infant and early childhood mortality. It was thus considered important for the programme to invest resources in the production of audiovisual aids as prototype material which can be adapted to the needs of each country. The following material has been issued, or is near to be completed and will be issued soon:

- Two sets of 24 slides each on the Management of Cough in Children, one for Africa and the other for Asia, were produced by Teaching Aids at Low Cost (TALC), London, under a contract with WHO. The sets illustrate the steps of the management of a child with cough exactly as recommended in the WHO technical guides and in the training module. They were intended to be shown at the end of the ARI training courses as a summary of the module on the management of a child with cough. Although the main objective of the slides is for training health personnel, some slides can be used for health education sessions at the health centres and in the community.
- With the collaboration of the same institution in London, two flip-charts have been designed. Each contains 20 black and white line drawings, with the corresponding legends in English, on the management of children with both upper and lower respiratory infections. One chart was designed to help trainers to teach health workers how to treat a child with common respiratory infections. The other one is to use with parents and the community. They are being tested in India and the Philippines. The revised versions will be printed and distributed as examples of messages and illustrations for training and health education.
- An inherent difficulty in training health personnel in ARI is the impossibility to give in a written text the exact description of the abnormal respiratory noises. To overcome this difficulty, a record

cassette with the main respiratory noises in children has been produced by Graves Medical Audiovisual Library, London, and is distributed together with the learning modules and the sets of slides.

- A video cassette on the management of the child with cough was filmed with the cooperation of the Educational Resource Centre, Royal Children's Hospital, Melbourne, Australia. The video illustrates with sound and colour image normal and fast breathing, chest indrawing, wheeze, stridor, grunting, whooping cough and cyanosis in infants and young children. It is available in English, U-Matic PAL, NTSC and SECAM systems. The translation into French and Spanish is under preparation.

### 3.3. Planning and Implementation of the Control Strategies

With the exception of Latin America, and a few countries in other Regions, national ARI control programmes have not been started as yet. Nor has WHO been active in their promotion until quite recently. As mentioned in section 2, Programme Planning, the current mid-term programme had foreseen a preparatory phase - 1984 and 1985 - for the development of intervention strategies and supporting research, and a second phase, starting in 1986 for the formulation of national ARI control programmes.

The targets of the first phase were achieved during 1986 with the completion and printing of the managerial tools as described in the preceding sections. The formal start of phase 2 is marked in the Regions with the holding of inter-country workshops aimed at introducing the newly developed technical guides, training modules, operational manual and educational material to the senior staff of the Ministries of Health so that they can be properly informed on how to plan, implement and evaluate ARI control programmes.

The first workshop took place in New Delhi, for the South East Asia Region, from 29 October to 1st November 1986, and the second one in Manila, for the Western Pacific Region, from 10 to 14 November 1986. In 1987, three workshops, two in English and one in French, will be scheduled for Africa, two for Latin America, one for the Caribbean and one for the Eastern Mediterranean Region. Annex 1 presents the scheme of the workshops. There has been neither time nor resources to produce comprehensive training modules for programme managers. Given the imperative need to make the material available without further delay to the Ministries of Health, it was decided to hold this kind of workshop. In a period of six days, the participants review the technical bases of the programme, go through the two learning modules on case management, discuss the content of the operational manual and apply the acquired knowledge to solving exercises on the main steps of the managerial process.

The approach to planning will be along the following lines:

- (i) Delivery of ARI programmes must be integrated with the delivery of other primary health care services, since the major activities of ARI control will interact with activities of the MCH, CDD, EPI and essential drugs programmes, and will be executed by the same personnel.

(ii) ARI comprehensive development strategies and programme plans should be written as a distinct document before the activities are initiated; however they should be incorporated into the national health plan or primary health care programme as soon as possible.

(iii) Such plans must, as a minimum, describe and analyse the present situation, set objectives and targets for reducing ARI mortality in children, design and schedule activities for a 3-5 year period, establish monitoring and evaluation mechanisms and indicate budget allocations. An outline for the plan of action is provided in the WHO's Programme Guide (10).

As mentioned above, national control programmes are now operational in Latin America. In this Region two concerns exerted a decisive influence in moving ahead with ARI control programmes: the urge to accelerate the reduction of childhood mortality and the need to reduce the unnecessary use of antibiotics. In 1982-1983 the feasibility of the application of a standard plan of case management of ARI in the primary health care system was tested in Para state, Brazil, and in Panama. The interest in the ARI programme spread rapidly throughout Brazilian states and to other Latin American countries. Technical and financial support was provided by PAHO/WHO and by the UNICEF Regional Office for Latin America. ARI was included as a distinct component of the Child Survival Programme of the six countries of the Latin American Isthmus, a programme sponsored by the Government of Italy, the European Economic Community, UNICEF and PAHO/WHO. The ARI training modules were incorporated in the CDD Supervisory Skills Courses in Colombia, Mexico, Paraguay, Peru and Venezuela, in the English-speaking Caribbean countries and in the French Caribbean departments. A subregional seminar on CDD and ARI was held in Quito, Ecuador, in May 1986 with the participation of the Andean countries and Paraguay, to evaluate progress and define targets for the biennium 1986-1987. This meeting was sponsored by PAHO/WHO, UNICEF and the USAID.

In a WHO survey conducted in 1985 among the Ministries of Health of the South East Asia Region about the priorities in communicable diseases (in respect of morbidity, mortality, availability of control technology and feasibility of control), ARI was ranked in the third place, preceded only by malaria and diarrhoeal diseases. Soon after the survey, a Regional Consultative Meeting on ARI Programme was held in New Delhi, 8-11 October 1985. The main objectives were to discuss how the WHO strategy on ARI could be implemented in the countries and the nature of the operational studies required to collect information needed to facilitate the integration of ARI activities into the primary health care system. Sixteen participants from nine countries attended. The meeting provided an overall view of the possibilities and constraints existing in the participating countries for the development of the ARI programme (11). The extent of the problem was yet to be better defined but there was a clear recognition of the urgency to start programme activities in view of the huge mortality from ARI in childhood. Stress was placed on the need to adapt WHO guidelines and training material to suit local requirements and to integrate the training courses with CDD and EPI programmes. National ARI Committees or Task Forces have been created recently in Indonesia, Mongolia, Nepal and Thailand. Burma decided to proceed with the national control programme and a plan of action was drafted.

In the Eastern Mediterranean Region, Sudan and Tunisia have taken the initial steps for a national programme. A WHO consultant visited Sudan in 1986 to collaborate with the authorities in drafting the guidelines and a plan of operations. In Tunisia the plan of operations and the technical guidelines were approved in 1985. The programme started in three governorates, including Tunis city, in 1986.

In the Western Pacific Region, Viet Nam established the programme in 1985. A WHO consultant collaborated in the preparation of the plan of operations. The activities started in Ha Son Binh province, and were extended to another six provinces in 1986.

The names of the 18 countries which have established a national programme are listed in Table 1. In 12 the programmes were already operational by the end of 1986.

#### 3.4 Monitoring, surveillance and evaluation

Programmes which cannot be monitored and evaluated cannot be managed. Although it is too early to present results of monitoring, surveillance and evaluation of the ARI programme, the following initiatives have been taken:

##### (a) Management information system

The operational manual (10) provides guidelines on a management information system designed to monitor the operations and to measure progress in achieving the national objectives of the programme in terms of increase of cases managed according to guidelines (coverage) and reduction of ARI-related mortality (impact). The manual lists the most essential indicators of programme performance and the ways to obtain data on them.

At regional and global levels yearly information on the situation of the national programmes will be obtained.

From the evaluation efforts of Brazil, the first country which implemented a control programme, positive and encouraging signs can be reported. In Para state, the introduction of the ARI programme brought about a reduction of the misuse of antibiotics in children. At the beginning of the programme a survey among the health centres of its capital Belem showed that 31 % of the general practitioners usually prescribed two or more antibiotics for mild ARI cases, 48 % prescribed only one antibiotic and 21 % recommended just supportive measures. Twelve different antibiotics in a great variety of presentations, associations and dosage were used, almost at random. Two years after the implementation of the programme the great majority of the mild ARI cases were treated only with supportive measures. Either of two antimicrobials were prescribed for home treatment in 90 % of moderate cases, injectable penicillin or cotrimoxazole, as recommended in the guidelines of the programme. In the same period, the proportion of infant deaths attributed to ARI declined from 17 % to 10 % among all causes of death.

##### (b) Morbidity and mortality surveys

Special surveys are useful for collecting data on morbidity and mortality that cannot reliably be registered through routine information systems in developing countries, provided that a simple methodology can be followed. The ARI programme recommends the morbidity and mortality survey pattern, based on the cluster sample method, which is widely used by the control of diarrhoeal

TABLE 1. Status of ARI Control Programmes, July 1986

REGION AND COUNTRY	MOH'S UNIT RESPONSIBLE FOR ARI	WRITTEN PLAN OF OPERATIONS	IMPLEMENTATION STARTED	PROGRAMME EVALUATED	COMMENTS
<u>AFRICA</u>					
Malawi	EPID	Draft	-	-	-
<u>AMERICA</u>					
Bolivia	EPID	Yes	Yes	-	-
Brazil	TRI	Yes	Yes	Yes	13 states
Colombia	MCH	Yes	Yes	-	6 areas
Costa Rica	MCH	Yes	Yes	Yes	-
Ecuador	TRI	Yes	-	-	-
El Salvador	TRI	Yes	Yes	-	-
Guatemala	EPID	Yes	Yes	Yes	4 countries
Honduras	EPID	Yes	Yes	-	-
Mexico	TRI	Yes	Yes	-	-
Panama	MCH	Yes	Yes	Yes	3 health regions
Paraguay	EPID	Yes	Yes	-	5 health regions
Peru	CSP	Yes	-	-	-
Venezuela	MCH	Draft	-	-	-
<u>EASTERN MEDITERRANEAN</u>					
Sudan	EPID	Draft	-	-	-
Tunisia	MCH	Yes	Yes	-	3 governorates
<u>SOUTH EAST ASIA</u>					
Burma	EPID	Draft	-	-	-
<u>WESTERN PACIFIC</u>					
Viet-Nam	TRI	Yes	Yes	-	7 provinces

Abbreviations: EPID : Epidemiology/Communicable Diseases  
 CSP : Child Survival Programme  
 MCH : Maternal and Child Health  
 MOH : Ministry of Health  
 TRI : Tuberculosis and Respiratory Infections

diseases (12). Because the magnitude of the two problems is quite similar in most developing countries and the target age group is the same, a joint sample survey can be organized efficiently to collect data on morbidity and mortality of both problems. An ARI questionnaire (Annex 2) was designed to register the data from the survey home visits on morbidity during the past two weeks and on deaths during the last twelve months. The questions are presented along the format and order of the diarrhoeal diseases form so that they can be easily combined in a single questionnaire. The sample survey will be programmed to be repeated every 3 or 4 years.

Combined ARI/CDD/EPI surveys were conducted in 1985 in Mongolia and in a rural area near Chandigarh, India. In Mongolia, thirty clusters of 150 children under 5 each (4500 children) were selected. The surveys were carried out by local health workers under the supervision of a joint national/WHO programmes review team. The proportion of children who had an episode of ARI in the previous two weeks (autumn season) was 14 % in Ulan Bator and 13 % in four aimaks of the country. The overuse of antimicrobials was a main finding: they had been used in about 70 % of all ARI cases. Hospital admissions were 15 % in the capital and 9 % in the interior of the country. The sample was too small to produce information on the mortality rates.

In Chandigarh, three surveys were organized during the year, in February, May and October. The incidence of ARI episodes in a two-week period ranged from 19.3 % in October to 34.9 % in February. The proportion of moderate/severe cases among all the ARI cases varied between 20 and 30 percent.

#### (c) Surveillance of etiological agents

The Bacterial Diseases and Virus Diseases programmes, under the Microbiology and Immunology Support Services, are responsible for the global surveillance of respiratory bacteria and viruses. The system has functioned with the participation of the networks of national and international Collaborating Centres for many years. Both programmes have issued guidelines on rapid diagnostic techniques (13, 14) and cooperate with the quality control and distribution of reagents. World-wide information on the distribution of pneumococcal types in the various Regions has been collected through the services of two Collaborating Centres, the Department of Research Medicine, University of Pennsylvania School of Medicine, Philadelphia, and the Streptococcus Department, Statens Seruminstitut, Copenhagen.

The ARI programme has established cooperation linkages with the Board on Science and Technology for International Development (BOSTID), US National Research Council, Washington, which sponsors international research on diagnosis and epidemiology of ARI in children.

A national workshop on surveillance of viral and bacterial agents of ARI was organized in Beijing, China, with the support of the Western Pacific Regional Office, in October–November 1985. A second workshop on epidemiology and bacteriology of ARI in children was held in the same place in November 1986. A regional training course for Latin American countries on laboratory techniques for diagnosis of ARI was organized in Panama in 1985.

(d) Surveillance of bacterial drug resistance

A global surveillance system was initiated in 1986 to monitor the drug resistance of Streptococcus pneumoniae and Haemophilus influenzae, the two most common bacterial agents of lung infections in infants and young children.

Under a WHO contract, the Streptococcus Department, Statens Seruminstitut, Copenhagen, started the preparatory work to coordinate the surveillance of pneumococcal drug resistance among strains isolated from children in developing countries. So far 10 countries agreed to participate in the surveillance system ( Argentina, Chile and Venezuela in Latin America, Gambia, Kenya and Mauritania in Africa, Saudi Arabia in the Eastern Mediterranean Region, India in South East Asia, and Malaysia and Papua New Guinea in the Western Pacific. Each participating laboratory should isolate 200 strains of Streptococcus pneumoniae from oropharyngeal swabs taken from children with ARI (100) and from healthy children (100). In addition all strains isolated from blood or from the cerebrospinal fluid during the survey period will be included in the study. The drugs to be tested will be oxacillin (indicator of penicillin sensitivity) and cotrimoxazole.

A similar system is being organized for the surveillance of Haemophilus influenzae drug resistance. A contract with the Public Health Laboratory Service, John Radcliffe Hospital, Oxford, UK, was signed at the end of 1986.

(e) Special studies

The routine information system to collect data on ARI mortality is usually incomplete and unreliable in developing countries. A special study was undertaken by the programme in 1985 to estimate the world magnitude of mortality from acute respiratory infections in children under 5. Any source of information was consulted, mainly reported data, special surveys and published papers. The results of the analysis were published in the World Health Statistics Reports (15). The main findings of this study were:

- the annual number of ARI-related deaths in children under 5 is at least 4 000 000, 2 500 000 in infants and 1 500 000 in children 1-4 years of age
- ARI represent 27 % of all deaths in children under 5.
- more than 90 % of child deaths occur in developing countries where children under 5 represent about 15 % of the total population and contribute to over 50 % of all deaths.

(f) International Classification of Diseases: Respiratory Infections

Upon WHO's request a Working Group was convened by the Collaborating Centre for Acute Respiratory Infections at St Mary's Hospital Medical School, London, and the International Union Against Tuberculosis. The Group met in Paris from 29 March to 1 April 1985, to draft proposals on the classification of respiratory infections for the Tenth Revision of the International Classification of Diseases. The recommendations of the Group were published (16) and have been submitted to the WHO programme responsible for the Tenth Revision of the ICD. The guiding principle was that the classification should

address the needs, not of the scientists, but of the decision-makers at the various levels of the health care system. Within the limitations imposed by the general principles established by the WHO Expert Committee on the 10th Revision of the ICD, the Group scrutinized the 9th Revision to identify omissions, errors and inappropriate disease categories in the light of present knowledge and the ARI control strategies. It is of particular interest that the report recommended that acute respiratory infections should be a main heading of the classification, as separate of other diseases of the respiratory system, in recognition of the importance of ARI in WHO programmes and to make ARI identifiable as a single entity at the most basic level of the health care system. Other important recommendations were:

- to clearly separate upper from lower acute respiratory infections
- to classify acute epiglottitis together with croup as acute obstructive laryngitis
- to classify lower respiratory infections primarily based on the anatomical location of the infection, into three main categories: bronchitis, bronchiolitis and pneumonia.

### 3.5 Collaboration in ARI between WHO and UNICEF

Awareness of the problem of acute respiratory infections in children has provided a specific incentive for further collaboration between WHO and UNICEF in their struggle for child survival in the framework of the Health for All Strategy. Both organizations agreed in the need to utilize the appropriate current technology at the community level to reduce the considerable death toll from ARI in children in developing countries. The concurrence was spelled out in a Joint Statement on Basic Principles for Control of Acute Respiratory Infections in Children in Developing Countries, which was approved by the 25th session of the UNICEF/WHO Joint Committee on Health Policy, Geneva, 28-29 January 1985. The statement was published in English, French, Portuguese and Spanish (17).

As a follow-up of the publication of the Joint Statement, a technical meeting on the Inter-agency Cooperation in Acute Respiratory Infections was held in New York, 18-19 March, 1986. It was stressed that the country programme constituted the central line of UNICEF-WHO cooperation in ARI. The activities which UNICEF and WHO will jointly support were defined:

- preparation and printing of technical guidelines and training material on case management for the peripheral levels of health care,
- production of locally relevant health education material
- training of primary health care workers
- provision of clinical equipment and drugs
- development of communications/health education programmes
- programme evaluations

Since 1984 close cooperation for control of ARI was maintained between the UNICEF Regional Office for Latin America and PAHO/WHO Regional Office. The technical area of ARI was included in the four inter-agency coordination meetings for collaboration in maternal and child health which were held in the

last two years. As a result, both Regional Offices coordinated their support to country programmes, rendered joint advisory services, supported the local printing of ARI guidelines and educational material, and organized jointly seminars and training courses.

At the global level it was decided to set up a joint working group to work on the Information/Education/Communication component of the programme. UNICEF will join WHO in the funding of ARI News in 1987.

#### 4. Research Component

At the inception of the programme, the limited resources available dictated that research be conducted initially on a selected list of topics; these topics were of particular relevance for the development of the case management strategy. To develop the field more broadly a concerted effort was launched to put interested investigators in touch with organizations with different research priorities and to share information generally.

Much of the initial activity supported either in whole or in part by WHO was funded through the Western Pacific Regional Office. These investigations antedate the period covered by the present report and include the work in Goroka, Papua New Guinea, which identified the role of specific bacteria in respiratory mortality (18). Morbidity studies in which data on risk factors were collected were carried out in Goroka (Papua New Guinea), Beijing (China) and Manila (Philippines). In addition a study on the etiology and clinical aspects of ARI in children was conducted in three general hospitals in Malaysia.

At global level, research was oriented from the beginning to collect information to determine the best ways of applying available knowledge and of implementing the strategies of the health service component at the country level. Feasibility and intervention studies were therefore given considerable attention. As described in detail below, during the past two years clinical trials and the measurement of indoor air pollution levels in rural areas were included among the research activities. The newly established Vaccine Development Programme in the Division of Communicable Diseases selected respiratory viruses and encapsulated bacteria as priority areas for financial support.

##### 4.1 Health systems research

With support from WHO and other agencies, projects on feasibility and impact on mortality of ARI control strategies have been undertaken in 10 countries (Table 2). All were designed to provide guidance to national programmes which would subsequently be based upon them. They can all be termed "mortality impact and feasibility studies" although, as will be seen below, the details vary somewhat. In general the objectives are the same:

- i. To obtain data on mortality from ARI in children in the less-than-5-years age group in a rural area (Only Tunisia has chosen an urban area).
- ii. To obtain information on present management procedures regarding ARI in children in the health care system.

TABLE 2. WHO-Sponsored projects on feasibility and impact on mortality of ARI control strategies among children less than 5 years old.

COUNTRY	STUDY AREA	Control	Sample Size Intervention	Estimated Infant Mortality	Funding Source	Situation August 1986
1. Kenya	Maragua	6000	6000	80	SIDA/SAREC	2nd year programme implementation
2. India*	Ambala district, Haryana	211	199	70	ACFUND	Completed
3. Indonesia	Kendiri, West Nussa Tenggara	-	8000	100	JSIF	Collection baseline data
4. Nepal	4 villages SW Kathmandu valley	-	1100	110	UNICEF	2nd year programme implementation
5. Pakistan	Abbotabad	1500	5600	80	AGFUND	2nd year programme implementation
6. Philippines	Bohol island	14000	14000	70	ADAB	2nd year programme implementation
7. Somalia	Afgoi	-	2500	120	SIDA/SAREC	2nd year programme implementation
8. Sri Lanka	Padukka	-	7500	20	SIDA/SAREC	Interrupted
9. Tanzania	Bagamoyo	8000	8000	40	GTZ	Completed
10. Tunisia	Sejourni	-	13000	70	JSIF	1st year programme implementation

\* Low-birth weight infants only

Abbreviations:

ADAB : Australian Development Assistance Bureau  
 ACFUND : Arab Gulf Programme for United Nations Development Organizations  
 GTZ : Agency for Technical Cooperation, Federal Republic of Germany  
 JSIF : Japanese Shipbuilding Industry  
 SIDA/SAREC : Swedish International Development Authority/Swedish Agency for Research Cooperation with Developing Countries

- iii. To develop a detailed plan based on WHO recommendations for case management of ARI in children for the training of the village health workers and the staff of the health centres, subcentres and posts.
- iv. To determine the effect of health education on knowledge and practices of parents in relation to ARI in children.
- v. To apply and test the procedures which are to be employed in a control programme, and establish a system for the collection and analysis of implementation data so that the evaluation of programme activities is possible.
- vi. To observe the trend in the ARI-related mortality in children after the strengthening the EPI in the study area, implementing the standard plan of case management of ARI and delivering a programme of health education.

These mortality-impact studies are feasibility studies which in addition satisfy the methodological and statistical needs of epidemiological research. To measure changes in mortality a valid basis for comparison is necessary. The best way to ensure comparability is to observe a control area side by side with the intervention area. This methodology has been adopted in Kenya, India, Pakistan, Philippines and Tanzania. The design is costly and great care has to be taken that the control area is not also influenced by the programme. In other countries, some modifications of the design have been made. For example, in Indonesia and Nepal, it was decided to use a before-and-after comparison as the programme was applied in a particular area, which epidemiologically has important disadvantages. In other locations (Somalia, Sri Lanka, Tunisia) further modifications have been made, and the major emphasis is on the feasibility of the programme.

Two projects, the ones in India and Tanzania, both using side by side comparison areas have been completed. From others interim data are now available. The following is a summary of these results.

(a) India

The feasibility of standard case-management for ARI and its impact were evaluated in terms of mortality reduction in low birth weight infants, in Ambala district, Haryana, (near Chandigarh) India.(7). By two-stage cluster sampling 16 villages, with a population of 16 925 were allocated to the control area and 21 villages, with a population of 22 014, to the intervention area. In both areas birth weight of the newborn was recorded within 48 hours, and all babies weighing less than 2 500 g were included. Thus, the study concentrated on the group at highest risk of death from ARI, low birth weight children. The households were visited each week by trained field workers until the child reached one year of age. The workers recorded details of disease and outcome as reported by the mothers. Causes of death were verified by professional staff.

The primary health care workers in the intervention area were instructed in the management of ARI, notably in discrimination between mild, moderate, and severe ARI, and they gave oral penicillin in moderate and severe cases and referred severe cases. In all other respects the standard WHO recommendations were followed, as part of primary health care.

There were 199 low birth weight babies in the intervention and 211 in the control area. The numbers of episodes of moderate and severe ARI were 69 and 61 (34.7 % and 28.9 %) and the numbers of ARI deaths 6 and 15, (3.0 % and 7.1 %) respectively. Thus, in spite of a slightly higher rate of more severe disease in the intervention area, the ARI specific mortality rate was much lower. This reduction amounts to 58 %. The duration of the episodes of moderate and severe ARI was also lower in the intervention area (5.7 days) than in the control area (8.7 days). The efficiency of implementation can be measured in the marked increase in use of primary health care worker for initial ARI-related consultations.

(b) Tanzania

The feasibility and the impact on mortality of introducing ARI control measures were studied in the coastal district of Bagamoyo, Tanzania. The villages in this district were divided randomly into two groups. Training and deployment of village health workers was started in 1983 in the first group; it included instructions to visit each household with children under five years of age every 6-8 weeks, giving health education about recognizing severe ARI, treating moderate and severe cases immediately with co-trimoxazole and referring the severe cases. Training courses were given to health centre and dispensary workers. After 12 months the training and deployment of health workers proceeded to the second village group, improvement and refresher training being continued in the first group. Because of the delayed implementation in the second area there was a period in which an "intervention" and a "control" area existed. Births and deaths were reported to Medical Assistants in both areas and census surveys of births and deaths were made in 1984 and 1985.

In the first survey 8028 children under five year old were covered in the intervention area and 8098 in the control area. The numbers of deaths among them were 260 and 326, respectively. The interventions thus caused an apparent reduction in mortality of 19 %. The second survey covered 9099 children in the intervention and 9915 children in the control area, and the numbers of deaths were 266 and 347, corresponding to a reduction of 16 %. While such a reduction of mortality is of considerable value, outside observers have felt that a greater reduction could be achieved with better implementation of the case management programme.

Verbal autopsies showed pneumonia to be by far the leading direct cause of death (35.1 %) and measles to be the leading associated cause (12.4 %). Mortality reduction was not limited to pneumonia; it was also observed for other diseases, notably measles, malaria and diarrhoea, but the disease-specific figures did not attain statistical significance.

(c) Kenya

The study in Kenya is intended to evaluate the overall effect of case management as it is practised in a rural area through the regular health care system. The location of the study is in Maragua, located in the central highlands 60 km north of Nairobi. The work has now been underway for approximately one year. The design of the study is to have part of the area receive regular care as they would with no ARI case management; (control area) and the other part to receive care following the WHO recommendations (intervention area). The number of participants is relatively large, (40,000 total; 12000 children under age of 5 years) based on the need to show

statistically significant differences in the endpoints selected. The estimated infant mortality in this population is 82 per 1000 and in children under age 2 years 67 per 1000. It is expected that ARI will account for 25-30% of these deaths.

During the first phase of the study, a census of the population in the area was taken and opinion leaders were contacted to ensure the acceptability of the study among the local population. Thereafter, during the first year, baseline data were collected without the intervention being carried out. Deaths were monitored, and the use of verbal autopsy techniques developed as a supplement to other methods of ascertaining the cause of death. Various additional procedures were identified and put into practice to facilitate reporting of deaths between visits. Specific procedures were also developed at the single district hospital so that cases from the study area referred there could be recognized. The baseline period was scheduled to end in December. The investigator recognized from the start the danger that the use of the case management technique might influence the regular care given in the control area, and methods have been recommended to identify this problem should it develop.

The Kenyan study should answer many questions both in terms of the exact magnitude of the effect of case management on ARI disease outcome and the ease with which the programme can be introduced. In addition, a portion of the Maragua area, not included in the intervention study is the site of an investigation of the etiology and epidemiology of ARI, sponsored by the US National Academy of Sciences (BOSTID). In this study, a smaller number of children are followed more intensively to identify episodes of ARI of all types and their causes. It is certain that the same bacterial and viral agents will be circulating in this small area as in the neighbouring much larger area where the intervention study is taking place. Thus it will be possible to relate outbreaks of infectious agents producing peaks of illness and a few deaths in the one area to a significant increase in mortality in the other. In addition to the advantages in interpretation of data, the coordinating of the two studies has other advantages including shared use of vehicles and of microcomputer equipment. Fiscal accounts are maintained separately for the projects, since the requirements of the two sponsors are different. It is hoped that future WHO research projects will be able to utilize similar coordinated approaches with bilateral projects.

(d) Philippines

In Bohol island, Philippines, monitoring of deaths is done by three complementary methods:

- a household survey every six months
- a continuous reporting by key informants, each of whom gather the information from 10 reporters who visit the houses twice a month
- the routine reports by the health services

Even by the best method no more than 75 % of the total deaths were reported. The combined sources indicated that the infant mortality rate in the study area was 67 per 1000 and the mortality among children 1-4 years of age 7.8 per 1000. ARI represented 26.9 % (14 per 1000) of the infant deaths,

and 45 % (4 per 1000) of deaths in children 1-4 years old. The rates were somewhat higher than those from records of vital statistics as a result of the more complete registry of vital events by the specially designed system.

(e) Sri Lanka

In contrast, in Padukka, Sri Lanka, the baseline information showed that the number of childhood deaths recorded in the study area was less than expected. The infant mortality was 20 per 1000 and the rate in children 1 to 4 was 2.2 per 1000, which are approximately half of the national figures reported for Sri Lanka. The analysis of causes of death, based on verbal autopsies and supplemented by inquiries of hospital records, indicated that ARI was the first cause, responsible for 25 % of the total number of deaths. Although some under-reporting might have occurred, checking of the data indicated that the number of unreported deaths could not be significant. In view of the low mortality rates the study was interrupted. The Ministry of Health proposed then to move into a national ARI programme starting operations in the mountainous central region, with higher than the country average childhood mortality.

4.2 Clinical research

Since the management scheme for ARI in young children is based on a clinical classification to be made by primary health care workers, it is of obvious practical interest to verify how well the workers can recognize signs and symptoms after a short training period, and whether the proposed classification indeed provides the optimal result (studies on the pathognomonic value of signs and symptoms of ARI in children). To do this, health workers are trained to recognize a variety of ARI related signs and symptoms and deployed to screen children presented at a health centre, recording their observations. The children are then examined by an expert pediatrician, treated as appropriate, and carefully followed-up. The signs and symptoms recorded by the health workers are then compared with the final diagnosis made and the optimal treatment determined a posteriori. Since by this approach the prevalence of ARI among the children is known, estimates can be made of the sensitivity and specificity of the proposed as well as possible alternative combinations of signs and symptoms as recognized by health workers.

One such study has started in Mandalay General Hospital, Burma, in May 1986. Its duration is one year; at least 200 cases of pneumonia are expected to be included among the children reporting from a defined area. A similar study will be carried out in Khartoum, Sudan, where the feasibility study to select an appropriate health facility has been successfully concluded. In the out-patient department identified the average daily number of children attending is 150. About 30 % have ARI, and there were 23 cases of pneumonia in one month.

4.3 Indoor air pollution studies

In 1985 the programme decided to initiate in collaboration with the WHO Prevention of Environmental Pollution Unit studies in several countries to determine and evaluate the contribution to the incidence and severity of ARI of indoor air pollution stemming from the combustion of biomass fuel. There are indications that high concentrations of acrid smoke and gaseous substances may impair pulmonary defence mechanisms. This problem is of particular concern in infants and young children living in rural dwellings without proper ventilation. (19).

In a first phase the project intends to collect data to assess the levels of indoor air pollutants (respirable particulate matter, carbon monoxide, nitrogen dioxide) in rural areas in which ARI studies are being conducted. The design calls for a 3-week survey in each area, during which 30 randomly selected houses are monitored with small battery-operated instruments placed inside the rooms for 24 hours.

The first survey was carried out in the ARI study area in Maragua, Kenya. The initial census indicated that wood was used as cooking fuel in 97 % of the houses, and charcoal in 3 %. The field work was completed this year, and the report will be published soon.

A consultant visited Guatemala to explore the feasibility of the survey in Colonia El Limon, a marginal urban area near the capital city, where an ARI epidemiological study is being implemented by the Institute of Nutrition for Central America and Panama (INCAP). A census indicated that wood burning-induced air pollution was likely to be present in very few houses, propane and kerosene being the most common fuels for cooking. For this reason the plans for the survey were not pursued.

Contacts have been established with the ARI project managers in Gambia, India, Indonesia and Papua New Guinea to propose they undertake this kind of survey in their plans of activities for 1987.

#### 4.4 Vaccine development

The case management approach to control of ARI mortality is being undertaken as an effective measure which can be implemented currently. In view of the enormous mortality involved, no other strategy could be ethically defended. However, vaccines will offer the long-term solution to the problem. For vaccine development to be undertaken better knowledge of the exact etiologic agents involved in mortality is needed; this is a major justification for the etiologic studies. Vaccine development itself does not need to wait for the conclusion of these studies since a general picture has already emerged about the bacteria and viruses involved. Indeed there is a suggestion that the current pneumococcal vaccine may have an effect on ARI mortality in some situations.

Within WHO, vaccine development grants are approved and administered through a group of steering committees under the supervision of the Scientific Advisory Group of Experts (SAGE). SAGE have decided to concentrate resources on the laboratory development of vaccines for a limited number of infections. Recognizing the importance of ARI, SAGE has created a steering committee on acute respiratory viral infections and they in turn have currently limited their activities to respiratory syncytial virus vaccines. Another steering committee is concerned with encapsulated bacteria, which include Haemophilus influenzae and the pneumococci. However, for the present, the committee has decided to concentrate efforts on the meningococcus, on the basis of a world-wide need and lack of support from other sources. The necessarily limited approach taken by SAGE points to the need for work on development of other required vaccines. Some of this activity is already taking place supported by national authorities and commercially, but world-wide coordination may be of use. Additionally, plans should be developed for short and long-term evaluation of the vaccines where the problem exists, in the developing countries.

## 5. Promotion and Information

Interest in information on acute respiratory infections has increased steadily in the last few years as a result of the growing awareness of the problem in developing countries and the efforts made by the programme and other interested organizations and agencies. However the limited resources have not allowed the promotion and information system to expand as rapidly as the needs.

The objectives of the promotion and information component are:

- i. to inform policy makers, national health authorities and professionals who are interested in ARI about the situation of the problem and the developments of the programme.
- ii. to disseminate valid information on experience in field projects and programmes, and on technological findings which may be of interest to ARI programmes in developing countries.

### 5.1 ARI Newsletter

In 1985 the programme promoted the production of ARI News under a contract with the Appropriate Health Resources and Technologies Action Group (AHRTAG), London, United Kingdom, and the financial support of Edna McConnell Clark Foundation, Kellogg Foundation and the Pan American Health and Education Foundation. In 1986 the Swedish Agency for Research Cooperation with Developing Countries joined as the main contributor to this project.

The publication has appeared regularly every four months and was distributed free of charge. Six thousand copies ( 8 pages each) in English were first printed, then the circulation was increased first to 15000 copies and in 1986 to 25000 copies. A Spanish translation will be produced by the Pan American Health Organization and the UNICEF Regional Office for Latin America. The first issue including the numbers 1 to 3 of the English version will appear by March 1987. The second issue, scheduled for August 1987, will produce the numbers 4 to 6 of the English publication. Ten thousand copies will be printed in each issue. The French translation has been assured with the collaboration of the International Union against Tuberculosis and Lung Disease, Paris, and will start in 1987.

The newsletter is the main vehicle of dissemination of practical information among health workers at health centres and small hospitals. Each number has a page as the Reader's Forum in which the points of view of those who are in the field are published as a means to establish a dialogue with them on their needs for information on ARI.

### 5.2 Publications

A special series of publications is produced by the programme. It includes manuals, guidelines, technical reviews, results of WHO-supported projects, reports of the Technical Advisory Group meetings and documents of other WHO meetings on ARI. These materials and the reprints of papers published in scientific journals and periodicals by the programme are distributed, free of charge, through the WHO computerized mailing list of ARI publications, which contains about 700 addresses. Although it is a rather small list, it includes the main institutions, public health administrators

and scientists in developing countries who are interested in ARI. At present the list of WHO ARI publications (Annex 3) offers 60 titles, of which 21 were added in 1985 and 1986. Many papers were translated to Spanish and distributed by the Regional Office for the Americas.

A Bibliography on Respiratory Infections in Children is being published in English by the Pan American Health Organization in collaboration with the US National Library of Medicine. The first volume covered the period January 1978-December 1982. Thereafter two issues a year have been issued- 4000 copies each, of which 3000 are distributed free of charge to developing countries and through the programme mailing list. A questionnaire on the usefulness of the bibliography was prepared in 1986 and sent to all the recipients together with the last issue.

### 5.3 Public information

With the assistance of the Division of Public Information and Education for Health a review was made of the problems which obstruct the implementation of ARI programmes in developing countries and which a public information programme can help to overcome. Some of the detected problems were:

- resistance of the medical profession to the idea of allowing the paramedical personnel to prescribe antimicrobials in rural areas.
- doubts about responsibility for the use of antimicrobials by paramedical personnel
- doubts about the ability of paramedical personnel to learn how to recognize the key respiratory symptoms.
- expectations of parents that antimicrobials will be given for every cough or fever in their children.
- bringing of seriously ill children too late to the health worker for effective treatment.

The decision was taken to produce a comprehensive Information Dossier, in English and French, to provide up-to-date information and to address these kinds of problems from the technical, operational, legal and social points of view. The dossier, now under preparation, will include a pool of articles, charts, tables and photographs, with which different information kits can be made for various target groups such as policy makers, opinion makers, medical profession and public health administrators.

Members of the Technical Advisory Group and programme consultants participated in writing editorials on ARI in four well-known scientific journals (6,20,21,22) through which the international approach to this problem in developing countries was presented to the specialists and the medical profession in general of the developed countries.

## 6. Programme resources

### 6.1. Organization

Before the establishment of the programme, the Organization carried out some activities in acute respiratory infections through the programmes of the former Virus Diseases and Bacterial Diseases Units. The activities were mainly related to the surveillance of etiological agents, particularly

influenza, and to the standardization of laboratory diagnostic methods. The new programme was entrusted to the Tuberculosis Unit which was then renamed Tuberculosis and Respiratory Infections Unit. The additional task was assigned without increasing its staff consisting of a programme manager, a medical officer, a scientist, an administrative assistant and a secretary. The staff proved versatile and complementary to each other in the fulfilment of the variety of activities, allowing for efficient use of their knowledge and skills in both programmes. In 1986 a new medical officer and a part time secretary joined the Unit specifically for the ARI programme. Therefore an organizational structure was established within the Unit at the global level:

Promotion and Coordination of ARI and Tuberculosis programmes.	Programme Manager
ARI Service component	Medical Officer
ARI Research component	Medical Officer
Tuberculosis Research and Service components	Scientist

All the Regional Offices have designated a responsible officer for ARI within the programmes of Communicable Diseases, except in the Region of the Americas in which ARI, together with EPI and Diarrhoeal Diseases are under Maternal and Child Health. Full time ARI medical officers are in charge of the programme in the Regions of the Americas (two medical officers), South East Asia and Western Pacific. In Africa there is a Regional Adviser for Diarrhoeal Diseases and ARI. In Europe and the Eastern Mediterranean ARI is included among the functions of the Regional Advisors in Communicable Diseases.

The scientific and technical review of the programme activities is the responsibility of a Technical Advisory Group (TAG) composed of leading experts in pediatrics and epidemiology of ARI, and public health administrators from outside WHO. The Group met twice, in March 1983 (1) and in March 1985 (3). The third meeting will be held in Geneva, 9 - 13 March 1987.

#### 6.2 Meeting of Interested Parties for the Prevention and Control of Acute Respiratory Infections in children

The meeting took place in Geneva, 23 - 24 October 1986 with the participation of seventeen governmental and non-governmental agencies, and experts from developing countries.

The purposes of the meeting were to examine the technical and managerial aspects of the WHO's ARI programme, the activities planned, the programme budget for 1987 and 1988-89, and the financial and organizational commitments by interested parties.

The participants expressed their satisfaction with the progress made in the development of the intervention strategies, the production of managerial, instructional and educational material, the dissemination of information and the plans for the expansion of the health service and research components of the programme. The increased budgetary needs were considered justified with regard to the proposed implementation of service activities and country level together with the supporting research. Pledges of financial support to the programme were made by three agencies. Other agencies indicated their

willingness for further discussions with WHO about possible contributions to the programme, and for including ARI within the context of their bilateral support programmes.

The full report of the meeting is attached as Annex 4.

### 6.3 Budget

The programme's financial position as at December 1987 under all sources of funds is shown in Table 3.

Before 1982, specific appropriations for the ARI programme in the WHO regular budget were only allocated by the Western Pacific Region in the amount of \$ 242 000 (supplemented by \$ 5838 from the Australian Development Assistance Bureau and \$ 77 810 from the Japanese Shipbuilding Industry Foundation) for etiological and epidemiological studies on ARI in Goroka, Papua New Guinea.

Specific appropriations for the ARI programme in the WHO regular budget were first approved in the biennium 1982-1983. Then only the Western Pacific Region and the global level allocated funds for the programme, amounting to \$ 638 900. This sum was increased by 64% in the budget period 1984-1985, exceeding the level of \$ 1 000 000, mostly due to a substantial increase in the global level allocation and to an appropriation of \$ 200 000 from the Director-General and Regional Directors Development Programme. A total of \$ 1 322 500 was allocated for the present biennium 1986-1987, a 25 % over the previous period figure. In reality the total is higher than that because the Regional Offices of Africa and the Americas include certain ARI activities under other broader programmes.

Until now nine agencies and organizations made extrabudgetary contributions to the programme, as listed in Table 3. The total extrabudgetary contributions totalled \$ 206 050 in 1982-1983, and reached \$ 754 640 in 1984-1985. For the current period 1986-1987, \$ 1 248 590 have been assured.

In summary the total resources budgetary and extrabudgetary of the programme since its inception have been as follows

1982-1983	844 950
1984-1985	1 809 540
1986-1987	2 571 090

These figures do not include \$100 000 which, upon WHO's request, were given direct to AHRTAG, London, for the production and distribution of the ARI News contributed by the Edna McConnell Clark Foundation (\$30 000) and the Pan American Health and Education Foundation (\$60 000) and UNICEF (\$10 000).



Table 3. Resources available as at 31 December 1987

SOURCE	1982-83	1984-85	1986-87
REGULAR BUDGET			
Global and Inter regional	296 800	441 500	387 400
Regions	342 100	413 400	685 100
Director-General and Regional Directors		200 000	250 000
Development Programme			
<b>SUB-TOTAL</b>	<b>638 900</b>	<b>1054 900</b>	<b>1322 500</b>
OTHER SOURCES			
Italy		49 500	80 400
Japan			145 000
Netherlands			175 950
Sweden	75 000	141 336	547 140
Pan American Health Organization			68 800
UNICEF			7 000
Arab Gulf Programme for UN Development Organizations	40 000	280 000	
Kellog Foundation		34 000	68 000
Japanese Shipbuilding Industry Foundation	91 050	294 804	156 300
<b>Sub-Total</b> 234 000	<b>206 050</b>	<b>754 640</b>	<b>1248 590</b>
<b>T O T A L</b> 234 000	<b>844 950</b>	<b>1809 540</b>	<b>2571 090</b>



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WORKSHOP ON ARI CONTROL PROGRAMME  
INTRODUCING THE OPERATIONAL MANUAL FOR PROGRAMME MANAGERS  
AND THE TRAINING MODULES FOR MID-LEVEL SUPERVISORS

Day	Total time (hours)	Topic	Method of presentation
1	2	Review of technical bases of the WHO ARI Programme in developing countries: (a) Epidemiology: morbidity, risk factors and mortality (b) Etiology: viruses and bacteria (c) Non-specific preventive measures; nutrition, prenatal care, protection against environmental factors (d) Specific preventive measures: immunization, case management, health education	Lectures Discussion
	5	Description of the ARI problem Programme strategies and information required for planning	Read chapters Discussion: (a) Epidemiological and operational data needed (b) Sources of data needed (c) Spec. small surveys to obtain planning data (d) strategies
2	8	Management of the child with cough	Training module
	2	Management of the child with cough	Slide presentation Discussion
	2	Management of the child with ear, nose and throat infection	Training module
3	4	Setting objectives and targets Operational planning: Designing the steps for programme implementation	Read chapters <u>Exercise A:</u> Prepare schedule of activities Discussion
4	4	Assessment of children with ARI	Visit to a ward and to an outpatient department of a hospital
	4	Operational planning: (Continuation)	<u>Exercise B:</u> Calculate drug needs Discussion

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5	3	Training of personnel Health education and promotional activities	Read chapters Discussion (a) Planning training (b) Determining target audiences and messages
	2	Monitoring and surveillance	Read chapter Discussion: Determining what and how to monitor
	3	Supervision	Read chapter <u>Exercise C</u> : Designing a checklist for a supervisory visit

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6	4	Evaluation	Read chapter <u>Exercise D</u> : Evaluate programme's impact on reduction of mortality Discussion
	3	Summary and conclusions	<u>Exercise E</u> : Prepare an outline of a Plan of Operation Discussion

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4. Have any children <5 years old died in this household in the past year? IF YES, for each death, ask the age and signs and symptoms which were present in the week before death.

	Age <1 year	at death: 1-4 years	Death 1	Death 2	Death 3
1 Rash					
2 Cough					
3 Fever					
4 Fast or difficult breathing					
5 Noisy breathing					
6 Convulsions					
7 Other (specify)					
8 None					

5. Was the child seen by a health worker?

1 Doctor					
2 Paramedics (e.g., nurse)					
3 Community health worker					
4 Traditional health practitioner					
5 Others					
6 None					

6. In the opinion of the household, what was the cause of death?


7. In the opinion of the survey supervisor, was the death

1 "ARI-associated"?					
2 Other cause					

8. Comments:

Annex 3

TUBERCULOSIS AND RESPIRATORY INFECTIONS UNIT  
DIVISION OF COMMUNICABLE DISEASES

CURRENTLY AVAILABLE PUBLICATIONS AND DOCUMENTS ON RESPIRATORY INFECTIONS

N.B. Unless otherwise stated, e.g. "E, F & S" (English, French and Spanish), these publications exist in English only. Single copies can be supplied free of charge. When ordering, it is sufficient to indicate the number of the item required.

CONTENTS

- A. ARI CONTROL IN GENERAL
- B. ARI RESEARCH IN GENERAL
- C. MICROBIOLOGY
- D. IMMUNOLOGY AND IMMUNIZATION
- E. CASE MANAGEMENT
- F. TRAINING AND HEALTH EDUCATION
- G. EPIDEMIOLOGY AND STATISTICS
- H. PAHO/WHO BIBLIOGRAPHY SERIES ON RESPIRATORY INFECTIONS  
IN CHILDREN

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- H.3 Volume 2, Number 2, July-December 1983
- H.4 Volume 3, Number 1, January-June 1984
- H.5 Volume 3, Number 2, July-December 1984
- H.6 Volume 4, Number 1, January-June 1985
- H.7 Volume 4, Number 2, July-December 1985
- H.8 Volume 5, Number 1, January-June 1986
- H.9 Volume 5, Number 2, July-December 1986 (in press)



REPORT ON THE FIRST MEETING OF INTERESTED PARTIES FOR THE  
PREVENTION AND CONTROL OF ACUTE RESPIRATORY INFECTIONS IN CHILDREN

Geneva, 23-24 October 1986

Introduction

Awareness of the problem of Acute Respiratory Infections (ARI) in children has increased markedly in recent years, especially in developing countries, and has provided a specific incentive for further collaboration between WHO and bilateral and multilateral cooperation agencies in their programmes to reduce childhood mortality by the utilization of appropriate technology within the primary health care system.

The purposes of the meeting were to examine the technical and managerial aspects of WHO's ARI programme, the activities planned, the programme budget for 1987 and 1988-89, and the financial and organizational commitments by interested parties.

Dr H. Mahler, in opening the meeting, underscored the excess mortality from ARI in children in developing countries. He found it almost inconceivable to set up an infrastructure to deliver primary health care services without paying due attention to ARI control, and stressed the need for concerted international support to the introduction of ARI control programmes now that the primary health care systems were being developed. WHO provided a broad forum for interested parties, both the supporting and the supported, to strengthen the coordination right from the start.

The agenda (Annex 1) and the list of participants (Annex 2) are attached. Several other agencies invited expressed their interest but unfortunately were unable to send a delegation at the time proposed.

Overview of ARI problem in developed and developing countries

A review of the global situation of ARI in children was presented. In the developed world, ARI is a cause of extensive morbidity, but mortality is low and confined to defined high risk groups. In contrast, ARI is one of the leading causes of mortality in children under age five in developing countries. At least 4 million children die annually of lower respiratory infections. Most deaths are caused by treatable bacterial pneumonia.

Strategies for intervention

Health education and case management constitute the central strategies of the control approach because, in the short term, they can significantly reduce ARI-associated mortality. Teaching parents to recognize the early signs of pneumonia in children with coughs and colds is one of the most crucial tasks facing health planners and managers. A simple management protocol has been developed on the basis of field experience in several WHO Collaborating Centres. It provides guidance to primary health care workers on how to decide whether or not to refer a child with ARI to a higher health care level, and if not, whether to give antimicrobials or only supportive measures.

A video film on the management of the child with cough was shown. Brief presentations were made on the feasibility and impact on mortality of the case management and health education education strategies in India, Nigeria, Brazil and other Latin American countries.

WHO's programme on acute respiratory infections

The activities in the ARI programme up to this point have been mainly concentrated on the development of intervention strategies and supporting research. The main components of the programme are:

- Health service, concerned with application of the present state of the art to the prevention and control of ARI in children.
- Technical guidelines, instructional material, a handbook for small hospitals and an operational manual have been prepared, tested and printed. Audiovisual materials have been designed as examples of messages and illustrations for training and health education. Plans have been laid for the monitoring of programme activities, the surveillance of bacterial drug resistance and epidemiological evaluation.
- Research, directed to strengthening the scientific basis of the programme and solving problems raised in the implementation of services.
- Promotion, aimed at ensuring dissemination of information, the necessary commitment of resources, and professional and public support. A special quarterly newsletter, ARI News, is the main vehicle for dissemination of practical information among health workers at health centres and small hospitals.

Planned activities for 1987

Having established the groundwork, the programme can proceed to the formulation of the national ARI programmes within primary health care systems and the development of manpower expertise. This implies a vast expansion of the activities and the resource requirements. The implementation phase will start with inter-country workshops aimed at introducing the newly developed technical and managerial materials to the senior staff of the Ministries of Health so that they can be properly informed on how to plan, implement and evaluate ARI control programmes. Collaboration will be extended in setting up the functional structure, preparing operational plans and organizing training, supervision, monitoring and evaluation of the ARI programmes.

Epidemiological and etiological studies will be continued. New, more simple, laboratory diagnostic tests are being developed and will be tested. Operational research is needed to find the most practical methods of implementation. Studies will be required to evaluate new or existing vaccines.

Budget

Budgetary provisions for the ARI programme have steadily increased over the last three financial periods from \$ 845 000 in 1982-1983 to \$ 2 160 000 in 1986-1987, including both the regular budget and the extrabudgetary sources. In order to meet the demand for rapid expansion, revised estimates have been prepared for the 1986-1987 biennium. A total budget of \$ 4 800 000 has been proposed, of which \$ 2 650 000 is still required from external financing. The budget for 1988-89 is projected at \$ 6 750 600, of which \$ 5 148 500 must still be raised from external sources.

## Discussion

There was general agreement that something should and can be done now about the ARI problem in children in developing countries, and also substantial agreement about what should be done. There were various questions on technical detail. The programme had been formulated by consensus since available knowledge was considered sufficient to do something forthwith. However, it has to be open-ended at several points because certain questions indeed need to be addressed locally. The specificity and sensitivity of the diagnostic procedures is a case in point.

WHO has prepared a study outline for national programmes to assess the pathognomonic value of signs and symptoms as can be perceived by primary health care workers. Currently two such studies are being supported, in Burma and Sudan. The purpose is not to "prove" the recommended case management protocol, but to find the one that is optimal under the local conditions.

Several participants found that the programme does not include enough basic research. One problem is that it is difficult to undertake research in the absence of a service programme. Nevertheless, etiological studies are now being undertaken in several countries with support from the US National Research Council. Basic research on vaccines is under the responsibility of the WHO Programme on Vaccine Development. The field testing of new vaccines against the bacterial and viral agents of respiratory infections will be undertaken with the full participation of the ARI programme.

The problem of drug resistance, and its possible uprising, is one that has WHO's attention. Support is being given to collaborating centres for the global surveillance of Streptococcus pneumoniae and Haemophilus influenzae resistance to commonly used antimicrobials. The ARI programme clearly advocates a rationalization in the use of antibiotics, rather than their indiscriminate use, precisely to minimize this possibility. Thus, while the indiscriminate use of antibiotics by people of all ages will continue to be a problem, the emergence of drug resistance would be much less likely the result of using the drug in children. Constant surveillance is of course necessary to assure the effectiveness of the antimicrobials recommended for use in the programme.

In considering implementation of the programme, the question of coordination within the Organization was brought up. It is true that the Organization advocates integration but itself splits up into divisions and technical programmes. But this is not a true contradiction. The objective of integration is to provide multiple or comprehensive services at the periphery; more centrally, expertise in various subjects is required and this is hard to find under one generalist hat.

The question of having a combined newsletter or a number of separate ones is relevant here. While this question comes in for regular review, the answer depends on to whom it is addressed. It also relates, of course, on the resources available. Coordination, or "linkage", surely is needed to come to a combined end product. Case management and health education training modules have been devised for inclusion in the Supervisory Skill Diarrhoeal Diseases courses. Combined protocols for mortality and morbidity surveys for ARI and diarrhoeal diseases have been prepared. But admittedly there is much room for improvement in the coordination with related programmes.

For the research activities in the ARI programme, there is no special review committee in view of the relatively small amount of funds allocated for this component. The subject however is kept under review by the Technical Advisory Group on ARI which meets every two years.

#### Conclusions

Having considered the technical bases and the report of the programme, the participants of the meeting expressed their satisfaction with the progress made in the development of the intervention strategies, the production of managerial, instructional and educational material, the dissemination of information, and the plans for the expansion of the health service and research components of the programme. The increased budgetary needs were considered justified considering the proposed implementation of service activities at country level together with the supporting research. Given the stage of programme development, the initiative taken by WHO to convene the meeting of interested parties had been timely to ensure technical coordination between agencies and to find efficient ways of utilizing the always scarce resources for multilateral and bilateral collaboration.

A big fund searching effort is underway to fill the gap between available resources and projected needs. Complete details on the programme activities and budget requirements for 1986-1989 are available in the principal documents prepared for the meeting (TRI/ARI/MIP/86.4 and WHO/RSD/86.30). Pledges of financial support to the programme were made by three agencies. Other agencies indicated their willingness for further discussions with the Secretariat about possible contributions to the programme. A number of agencies will consider the matter within the context of their bilateral support programme.

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