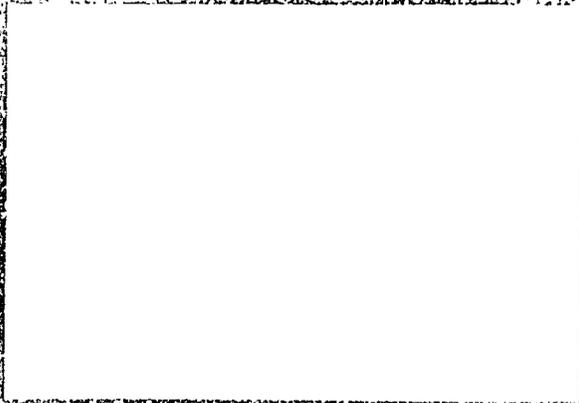


PN AEM-945



RESOURCES FOR CHILD HEALTH

PN-ABN-945
82042

**ARI TECHNICAL ORIENTATION
MEETING PROCEEDINGS**

JULY 31, 1991

Sponsored by:

**The Resources for Child Health (REACH) Project
1616 North Fort Myer Drive
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Arlington, VA 22209**

**USAID Contract No.: DPE-5982-Z-00-9034-00
Project No.: 936-5982
Activity No.: 1717-466**

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ACRONYMS

A.I.D.	Agency for International Development
ARI	Acute Respiratory Infections
CCCD	Control of Childhood Communicable Diseases
CDC	U.S. Centers for Disease Control
CDD	Control of Diarrheal Diseases Program
CDR	Division of Diarrhoeal and Acute Respiratory Disease Control
DHS	Demographic Health Survey Project
DPT	Diphtheria-Pertussis-Tetanus Vaccination
EPI	Expanded Program on Immunization
HIV	Human Immunodeficiency Virus
IMR	Infant Mortality Rate
MCH	Maternal and Child Health
ORS	Oral Rehydration Solution
ORT	Oral Rehydration Therapy
PVO	Private Voluntary Organization
REACH	Resources for Child Health
RTI	Reproductive Tract Infection
UNDP	United Nations Development Program
UNIPAC	United Nations Procurement and Assembly Centre
UNICEF	United Nations Children's Fund
URI	Upper Respiratory Infection
WHO	World Health Organization

Opening Remarks

Diane Hedgecock, REACH

Thank you all for coming to this ARI Technical Orientation Meeting today. Your participation shows the increasing interest on the part of international agencies to strengthen pneumonia control activities.

The REACH Project hopes that this technical orientation meeting will serve as an overview of what the different cooperating agencies and donor agencies are doing in ARI. It is not intended to be a comprehensive scientific meeting covering all the issues surrounding ARI; that will be the purpose of the upcoming International Consultation on the Control of Acute Respiratory Infections (ICCARI) Conference to be held in Washington, D.C., December 11-13, 1991, cosponsored by WHO, UNICEF and UNDP. Today's meeting is also not an intensive technical training workshop.

Therefore, the objectives of this ARI technical orientation meeting are to:

- provide a technical overview of the key issues in the development and delivery of ARI;
- develop a better understanding of what each cooperating agency and donor agency is doing in ARI control;
- begin to learn from one another through an exchange of experiences; to learn what the current needs are in ARI control; and
- create a forum for a continued dialogue to foster and strengthen our partnerships in ARI.

Although ARI is health problem that has always had an impact on childhood morbidity and mortality, this is a relatively new field for many of us; there is much to be learned. This workshop is just one of a series of technical meetings envisioned to take place over the next few years. Future technical meetings could focus on some specific areas of ARI control, such as the costing and financing of ARI programs, ethnographic issues related to ARI control, etc.

Dr. Ann Van Dusen, Acting Director of A.I.D.'s Office of Health, will begin the morning session with introductory comments. This will be followed by presentations by representatives of three donor agencies -- WHO, UNICEF and A.I.D. They will discuss their agency's strategies, initiatives and activities in ARI. Dr. Nils Daulaire of the REACH Project will then give a technical presentation on ARI.

The afternoon session will include presentations from six centrally funded projects from A.I.D.'s Office of Health, describing their experiences in strengthening ARI programs. Lastly, we will hear presentations from three groups that will describe some specific country experiences in implementing ARI activities.

We welcome comments and feedback from all the meeting participants on the usefulness of today's workshop. Comments can be directed to Jerry Gibson, who is the coordinator for A.I.D.'s ARI activities in the Office of Health, and Bob Weierbach, the ARI Coordinator for the REACH Project.

Welcome

Ann Van Dusen, U.S. Agency for International Development

I am very pleased to welcome all of you to this ARI Technical Orientation Meeting.

Orientation suggests a beginning, but ARI and A.I.D. have had a long history. A.I.D. has come a long way to get to the point where now, in 1991, we are having a technical orientation meeting. For those of you who have not been through the whole of A.I.D.'s ARI history, I think it is instructive to review it. In 1986, when A.I.D. developed its child survival strategy, I do not think it even mentioned ARI. Then, our focus was on oral rehydration therapy and immunization, and we discussed other activities that would complement those "twin engines." By 1987, A.I.D. realized that, notwithstanding any formal policy in this area, there were some 50 A.I.D.-supported PVOs involved with ARI. Without any guidance from A.I.D., ARI was being tackled in the field. This was clearly in response to the health needs of the communities where PVOs were working.

In 1988, A.I.D. began to consider adding an ARI component to the child survival strategy. However, we encountered problems convincing people that we could add ARI to our portfolio without simultaneously compromising EPI or diarrheal disease control activities. For some time, ARI control was included in "Other Health" activities. There was a time when (and I think in part it continues today) A.I.D. referred to ARI as childhood pneumonia. This was done to prevent those individuals who thought we should not be diverting our attention away from the "twin engines" from realizing that we were indeed working in ARI control.

But today, there is full recognition throughout A.I.D. that ARI must be part of the Agency's child survival strategy. It does not make sense not to have ARI as a key component of what the Agency is doing to improve child health worldwide. The fact that four million children under the age of five are dying every year of respiratory illnesses cannot be ignored; nor can it be ignored that ARIs may pose the single greatest demand on the health system. ARIs are one of the major drains on family and health system resources in the use and misuse of antibiotics. These facts have come together to create the sense that it is time to get on with this next generation of child survival programs.

Even within A.I.D.'s spotty history in ARI control, we have learned some things about prevention both through the promotion of breastfeeding and through EPI programs. We have also learned about case management through clinical trials which have demonstrated the effectiveness of the case management approach. To suggest that A.I.D. is only now at the orientation stage ignores the fact that a great deal has gone on under the surface of our current child survival programs in ARI control. In the last three years, A.I.D. has supported 24 projects in the area of acute respiratory infection. Though we are just starting our formal technical orientation, six months ago the Agency anticipated that funding for ARI programs would double between fiscal years 1990 and 1992. Since the people and organizations represented at this meeting today will be the key players in A.I.D.'s ARI control activities, we need your expertise and full cooperation. Your presence here today suggests that it is not going to be difficult to double ARI programs by next year.

ARI control represents a challenge to the current thinking in A.I.D. about how we go about doing programming. Under the Agency's reorganization discussions there is the sense that with fewer personnel in Washington and in the field, and more resources coming in, that we have to use a top-down approach to implement programs. In this approach we have to say we are going to do "this" activity and we are going to do it "here." Programs are allocated to countries from the center. Our experience with ARI has been precisely the opposite. It has been a bottom-up approach. The center would probably be ignoring ARI today if it were not for the demand coming from the field. I think it is that demand from the field and the responsiveness of organizations like those represented here today that are going to keep our ARI programs on the front burners.

I am looking forward to today's discussions, and to working with all of you over the next few years as we integrate ARI into the Agency's child survival programs.

SESSION I

World Health Organization ARI Control Activities

Harry Campbell, World Health Organization

The WHO ARI program has contact with the full extent of global ARI activities and provides a framework for the many ARI initiatives that are taking place.

Administrative Structure

Within what is now known as CDR, is the division of diarrheal and acute respiratory disease control. The staff that are within CDR include Jim Tulloch, Director of the division, and Bob Hogan who is in charge of program management and works for both the CDD and ARI programs. CDD has recently established working groups that cut across the services of the two divisions.

In the ARI program, there are four professionals at the global level. Apart from myself, there is Antonio Pio, program manager; Sandy Gove, research coordinator, and Adriano Cattaneo, services coordinator. At the regional level, we have a full time person for ARI in each of the regional offices (Manila for the Western Pacific, New Delhi for Southeast Asia, Harare for the Africa region, Washington for the Americas, and Cairo for the Eastern Mediterranean).

The main objective of the ARI Program is to reduce the severity of and mortality from acute lower respiratory infections, especially pneumonia, in children. These conditions are at present the first cause of mortality in children under five years of age, causing about 4.3 million deaths in developing countries.

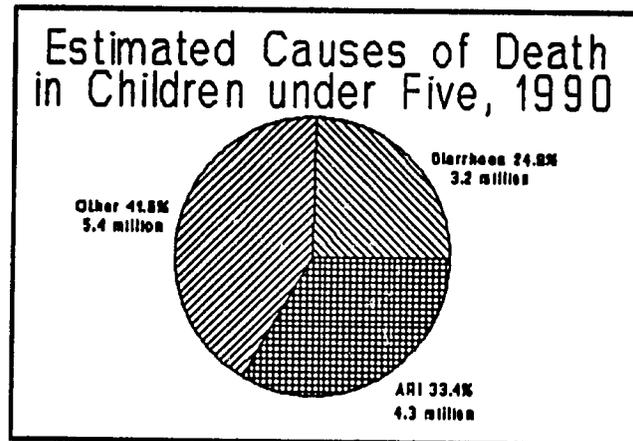
The forth-fourth World Health Assembly, in May 1991, in Resolution WHA 44.7, urged Member States to initiate activities for the control of ARI as an essential part of primary health care and as a high-priority program for reducing mortality in infancy and early childhood. The Regional Committee for Africa considered the status of the problem and the regional program at its forty-first session, in Burundi, in September 1991.

WHO, UNICEF and UNDP are jointly sponsoring an International Consultation on the Control of ARI (ICCARI) which will be held in Washington D.C., USA, in December 1991 to raise awareness among policy makers of the magnitude of the problem and increase their commitment to its control. A promotional videotape on the problem of ARI is being produced with UNDP and UNICEF collaboration in Tanzania and Bolivia.

The Need for ARI Control Programs

Why is ARI important, and why does WHO have a separate program for addressing ARIs? Figure 1 shows the latest WHO estimates of causes of death in children under age five.

Figure 1



ARIs are responsible for 4.3 million deaths, making it the single largest cause of death in children under age five. Though the allocation of cause-specific death is very difficult, we feel that these figures are probably as good as any others that we have, and underscore the importance of ARI as a cause of childhood death.

I would like to emphasize that ARI is a global problem. There are still documents circulating claiming that ARI is not a problem in Africa. It seems clear that ARI is a very important cause of childhood death in Africa. Although the routine data from Africa are not very good, there are a number of quality epidemiological studies in the Gambia, Senegal, Ethiopia and Tanzania, which provide evidence that ARI is as much of a problem in Africa as it is on other continents. However, it is important to remember that there is clinical overlap between malaria and ARI, particularly in Africa, making the assignment of cause of death difficult.

As Ann Van Dusen stated in her welcome, ARIs are also important because health staff commit considerable time and services to treating ARIs. Data from several countries indicate that some 30% of outpatient pediatric visits are due to ARIs, and about one-third of in-patient pediatric admissions are due to ARIs. Clearly health staff globally are committing considerable time and resources to this problem. Currently, there is very poor undergraduate or postgraduate training for ARIs, and given the time spent treating these respiratory infections, we believe that staff workers deserve better training, supervision and adequate drug supply to combat this major problem.

One of the recommendations made this year by the WHO technical advisory group is that we should think of ARI programs as a mechanism for improving a country's health infrastructure. It is a common misconception that ARI control cannot be achieved in areas where the health infrastructure is poor. We believe that ARI prevention is effective, that it tackles a need recognized by communities in developing countries and that a successful program is likely to enhance the standing of health workers in the community. ARI programs involve target setting, training, management and supervision, maintenance of a drug supply and evaluation. All of these components are likely to improve a health infrastructure.

Two targets established at the World Summit for Children were to reduce ARI deaths by 33% by the year 2000, and to reduce deaths from diarrhea by 50% by the year 2000. Clearly, to achieve the general targets set for reducing infant mortality, an ARI program is going to be essential. Since ARI is such an important cause of death in the first five years of life, then we are going to have to reduce mortality due to ARI to achieve significant reductions in infant and child mortality rates.

Is reduction in ARI mortality achievable? We are not certain, but we believe that it is. I think what is certain is that unless there is much more support for ARI activities than there is now, we are going to struggle to achieve the target that our political leaders have committed themselves to.

WHO ARI Program Objectives

The objectives of the WHO ARI program are:

- to reduce the pneumonia mortality in children;
- to reduce the severity of the complications from upper respiratory infections;
- to reduce the inappropriate use of drugs for ARI, both antibiotics and cough and cold medicines; and
- to prevent the incidence of acute lower respiratory infections, mainly pneumonia but also bronchiolitis.

The program strategy to achieve these objectives is primarily case management.

Immunization is certainly another important strategy to reduce morbidity and mortality. Currently there are vaccines against diphtheria, measles and pertussis. It is hoped that new vaccines can be developed and added to the EPI in the future, particularly vaccines against *pneumococcus* and *Hemophilus influenzae*. In the future vaccines against these organisms are going to be very important; however it would be overly optimistic to think that these vaccines will have much impact on ARI mortality by the year 2000. Therefore, to achieve mortality reduction in the next eight to ten years, we must focus on using the case management strategy. We hope that the new vaccines will make a major impact on ARI mortality in the future.

An additional strategy for controlling ARIs is preventing the risk factors for pneumonia. In this area, WHO has effectively accelerated its activities. There is much information (though of variable quality) on a number of risk factors and the relative importance and extent to which each can be prevented through feasible and cost-effective strategies. With the collaboration of the London School of Hygiene and Tropical Medicine, WHO will be undertaking an analysis of available information of the effectiveness of potential preventive strategies, with the ultimate goal of identifying those which are feasible for preventing pneumonia. Collaboration with other WHO programs (such as those working to reduce smoking or outdoor air pollution) will also be important in reducing risk factors for pneumonia.

Case Management of ARIs

At the beginning of 1990, the ARI program completed the revision of its case management guidelines. These guidelines have been summarized in two treatment algorithm charts. One chart provides guidelines on managing the child with cough and difficult breathing, and the other provides guidelines on managing the child with ear problems and sore throat. These charts were published in 1990 following three years of intensive work and field testing, and are the most complete and succinct descriptions of the key elements of the case management protocol.

On the basis of research information and field experience, the definitions of the key signs of pneumonia, mainly fast breathing and chest indrawing, were modified when preparing the first chart. The new definition of fast breathing calls for three, rather than two, thresholds: over than 60, 50 or 40 breaths per minute. The definition of chest indrawing has been made more specific to include the retraction of the lower part of the chest wall when the child breathes in. The revised definitions were published in 1990 as a manual entitled, *Acute Respiratory Infections in Children – Case Management in Small Hospitals in Developing Countries. A Manual for Doctors and Other Senior Health Workers*. This manual will be supplemented by a series of review papers. The first review paper, covering antibiotics and the treatment of children with ARI, has already been published. A second review paper outlining the technical basis for the case management strategy is currently being published. A number of others papers covering cough and cold medicines, bronchial dilators and oxygen therapy are in various stages of completion. Additionally, there is a final draft of an annotated bibliography providing over 100 references on case management and pneumonia. Lastly, a review paper is underway on temperature control, dealing both with the treatment of fever and the prevention of chilling.

Appropriate Technology

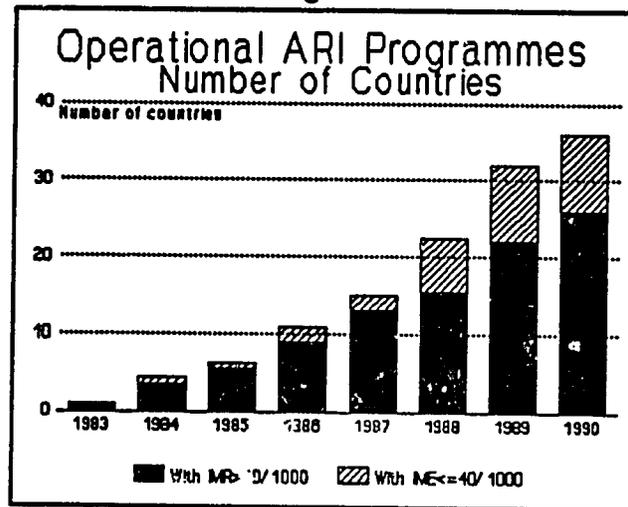
Devices such as one minute timers and oxygen concentrators are needed to ensure proper ARI case management. The timer is essential for some health workers to count the respiratory rate. With the collaboration of UNICEF, we have prepared specifications for an electronic timer, and distributed them to interested manufacturers. Three prototype models were submitted by companies from Denmark, Singapore and the United Kingdom, and were field tested in five developing countries. A number of design improvements were suggested following the field testing which were subsequently communicated to the manufacturers. We anticipate that these timers will be available in late 1991.

Our interest in oxygen concentrators – machines that extract oxygen from the air to produce highly concentrated oxygen – is related to the fact that oxygen is critical to saving the lives of children with very severe pneumonia. Oxygen concentrators are available in, at most, 25% of hospitals in developing countries. Through collaboration with the World Federation of Societies of Anesthesiologists, we drew up specifications for a simple oxygen concentrator. The concentrator must perform well in adverse environments with wide variations in voltages, high humidity and dust, and be relatively simple to maintain. Specifications were distributed to more than 20 manufacturers in seven countries. Four machines have been submitted to a laboratory for testing. We have produced an information leaflet and a user's manual for the oxygen concentrator, and are currently preparing a maintenance and repair manual. The oxygen concentrator models which meet the specifications will be made available, together with the supporting literature, to developing countries through UNIPAC and UNICEF.

Technical Support

In addition to developmental activities, WHO has maintained technical support for ongoing ARI programs. As of December 1990, 59 countries had prepared technical guidelines, 54 had prepared plans of operations and 47 had begun to implement programs. Figure 2 shows the fast growth in ARI programs worldwide, and the consequent demand for technical support from agencies such as WHO, UNICEF and USAID. These countries are distributed among all the WHO regions.

Figure 2



Progress in Africa has lagged compared to other regions due to competing health problems vying for financial and other resources. The global program has taken measures to ensure the development of ARI control activities in Africa by assigning a regional advisor for ARI, Stephen Daumling, and by increasing the extra-budgetary funds allocated to the region. We have also held two inter-country program manager courses. ARI will be discussed as a separate agenda item in the regional committee meeting in Africa later this year, and members of the WHO staff have recently traveled to Kenya and Nigeria to plan ARI programs there.

Establishing Programs

One of the major targets of the global program is that operational programs be established by 1995 in all countries with an infant mortality rate exceeding 40 deaths per one thousand live births. Presently, there are 88 such countries, 47 of which currently have operational programs. Among those with operational programs, 34 have an IMR over 40/1,000 (see Figure 3 on page 12). The emphasis on these countries does not imply that other countries do not also need ARI programs.

ARI programs are also justified in those countries that, despite having a low IMR, have regions within the country where the IMR exceeds the national average. China is one example. In the European region there is an interest in Albania, Romania, Yugoslavia, the USSR and Turkey. In these countries, although the national infant mortality rate is low, there are regions with very high infant mortality rates. ARI control strategies in these regions can be expected to reduce the number of deaths from pneumonia. In addition, all countries need to address the other objectives of the global program: to reduce complications from acute upper respiratory infections; to reduce the inappropriate use of antibiotics, and to prevent acute lower respiratory infections.

Training

The global program has given high priority to training activities. In 1990, a program manager's course was printed in English and Spanish. Translations into French and Portuguese have now been completed. In 1990, seven inter-country courses were organized with 199 participants from 62 countries. In addition there were 90 national courses in 15 large countries. Seventy-six awareness-raising national seminars and workshops were held in 15 countries with WHO collaboration. In India, for example, such meetings were conducted with the participation of 1,000 pediatricians. Some meetings were held in countries with experience in program implementation, such as Indonesia and Zimbabwe, to discuss revisions of technical guidelines and review operational progress. Nearly 120 supervisory skills courses were reported in 19 countries in 1990. The majority of these courses used the revised WHO supervisory skills module. This module is now available in English, French, Portuguese, Spanish, Chinese, Hindi and Arabic. A videotape has been produced to accompany the supervisory skills module. Filmed in 1990 in India, Papua New Guinea, Thailand and Zimbabwe, the video shows a wide range of examples of respiratory signs in children.

One of the main tasks of the global ARI program is to train all health workers in first-level facilities and hospitals in case management. The global program has supported the establishment of ARI training units. By the end of 1990, 24 such units had been established. In collaboration with ACT International in Atlanta, a package of training materials has been prepared to support outpatient case management. This package consists of lectures with accompanying slides, a training module guide for facilitators, guidelines for instructors, video presentations, case studies and guidelines for course directors. This module will be field tested shortly in India and Kenya. Additionally, a training package covering outpatient and inpatient case management is being prepared for use in the ARI training units.

Monitoring and Evaluation

Most of the activities in the area of monitoring and evaluation undertaken in 1990 were of the developmental nature. An important step was the selection of indicators to measure access to, and use of, the case management strategy. The ARI evaluation instruments are similar to those used for the CDD program. Indeed, it is hoped that an integrated evaluation of both programs will be possible in the near future.

Access indicators can partly be measured through data from routine reporting systems and record reviews. However, the best way is through a health facilities survey. We are producing a health facilities survey guide which will include several questionnaires for interviewing health personnel, interviewing mothers, reviewing clinical records, checking drugs and equipment needed for case management and observing health staff while they assess and treat children with ARIs. A set of questionnaires for outpatient case management has also been completed. A community-based survey is needed to assess morbidity from pneumonia and treatment practices. Although we cannot measure incidence of pneumonia, we hope to be able to estimate the prevalence of ARI episodes within the two or four weeks prior to the survey visit through a simple, feasible and reliable cross-sectional survey that can be used by all programs.

There has not been much activity in the area of impact evaluation, apart from the fact that the CDD program, together with the London School of Hygiene and Tropical Medicine, has developed a method of measuring mortality. We hope that we can use this methodology in some countries in the coming year to measure infant mortality and to extend from this instrument to get some indication of cause-specific mortality due to ARI and diarrheal diseases.

With the assistance of a health economist, the global program analyzed the issues involved in measuring the use and cost of drugs. Three approaches were recommended: 1) information on drugs described by first level facilities will be gathered through health facility surveys; 2) information on drugs used in the community for ARI will be gathered through household and treatment morbidity surveys, and 3) information on costs incurred by health authorities in providing drugs for ARI in children will be collected from records and reports at different levels of the health system. A guide for the collection and analysis of this information is being prepared in collaboration with the WHO program on essential drugs.

Research

In research, priority has continued to be given to four major areas: case management; behavioral research; health systems research and disease prevention research. Priority areas for case management research are pneumonia, sepsis and meningitis in young infants. Findings from a hospital-based study in PNG are shown in Table 1.

Table 1

REFERRAL TO HOSPITAL OF CHILDREN WITH ARI From Two Health Centers in PNG		
	Total ARI Cases	Cases Referred to Hospital
<u>Before ARI Program:</u>		
Jan-Sept 1987	2929	406 -13.9%
<u>After ARI Program:</u>		
Jan-Sept 1988	5765	311 - 5.4%
Oct 1988-Jun 1989	5869	125 - 2.1%

The data show that the health workers' ability to estimate that a young infant appears ill improved after the ARI program began.

A multi-center study to provide information on clinical signs of etiological agents of pneumonia, sepsis and meningitis in young infants has been initiated, and data collection has begun in Papua New Guinea, the Philippines and Ethiopia. A study in Haiti will also be underway soon. Such information from developing countries is now very limited, and is of key importance to the case management strategy.

Another important research area that is quickly emerging is investigating the clinical overlap of malaria and pneumonia. These are frequent causes of death, particularly in Africa. Earlier this year, we held a joint ARI-malaria meeting to review the results of studies conducted in Malawi and the Gambia. Briefly, the two studies showed that the antibiotic commonly used to treat pneumonia, cotrimoxazole, is also an effective antimalarial. The meeting participants recommended that in children presenting with both difficult breathing and fever, that cotrimoxazole would be adequate to treat both the pneumonia and malaria.

In behavioral research, the program has given priority to the development of a focused ethnographic survey protocol to assess beliefs and practices related to pneumonia and other respiratory conditions. The data collected are intended primarily for developing effective messages targeted to mothers of young children. The survey can be completed in five to six weeks, and the 1990 global program report presents the main results of ethnographic surveys conducted in Haiti, Honduras and Turkey. Courses to train sociologists in the use of the survey protocol have been organized in Mexico and Taiwan.

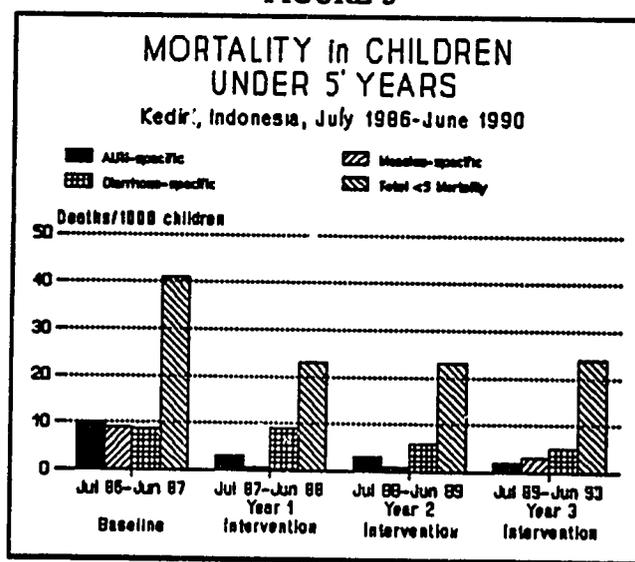
Table 2 shows some of the areas in health systems research being investigated by the global program.

Table 2

HEALTH SYSTEMS RESEARCH	
1.	Measuring Episodes of Pneumonia <i>Ghana, Peru, Philippines</i>
2.	ARI Intervention Studies <i>Indonesia, Nepal, Tanzania</i>
3.	Surveillance of Antibiotic Resistance <i>Pakistan</i>

Preliminary studies of how to measure the instance of episodes of pneumonia were conducted in Ghana, Peru and the Philippines. In 1990, data from Indonesia, Nepal and Tanzania became available showing that the ARI case management strategy has an impact on pneumonia mortality. The study in Kediri, Indonesia shows a reduction in overall and ARI specific mortality. As shown in Figure 3, this reduction was sustained in the third and final intervention year.

FIGURE 3



Similar data are also available from studies in Bagamoyou and Nepal's Jumla district.

Two studies in Pakistan have explored the susceptibility of strains of pneumococcus pneumonia to antibiotics for a national surveillance of antibiotic resistance. The results of these studies indicate that strains isolated from the nasopharynx were very similar in the type of microbial sensitivity to strains isolated from the blood of these same children. A meeting of experts in December 1990 reviewed the data from these and other studies, and recommended the use of nasopharyngeal strains isolated from children with signs of pneumonia for the surveillance of bacterial drug resistance. The draft manual on surveillance prepared in collaboration with the U.S. Centers for Disease Control was also reviewed at this meeting. Field testing for the manual is planned for 1991 in Egypt, Pakistan and the Philippines.

Information Dissemination

In addition to technical papers issued by the program in 1990, the global newsletter, "ARI News" remains the main vehicle for disseminating information on ARI to program staff, ministries of health, hospitals and first-level health facilities. Three issues are published annually, with 40,000 copies printed in English and Spanish, and 1,000 printed in Arabic. In addition, together with project partners, ARI News is made available in a number of other languages, particularly throughout Asia. A brochure describing the purposes and components of the ARI program is issued in English and French, and in December, 1991, there will be an international consultation on the control of ARI. We hope that this international meeting will generate the increased support needed both to reduce ARI and to meet the targets established at the World Summit for Children.

UNICEF ARI Control Activities

Ranjit Atapattu, UNICEF

Since much of what I was going to present was thoroughly covered in the WHO presentation, I will give a brief overview of UNICEF's involvement to date with ARI.

The ARI program at UNICEF is a field-driven intervention program. Long before the donor community issued any directives regarding ARI, our field officers were involving themselves in ARI in response to demands from host countries for ARI programs. Early on, most UNICEF interventions involved supplying antibiotics to countries, but in the last few years we have been encouraging field offices to support national level ARI program planning and policy formation. Even in those countries where UNICEF activities are limited to certain regions or districts, we urge field offices to get involved in the national picture. And, while promoting the integration of health programs, we also support the establishment of ARI units within the Ministries of Health for the purposes of program and policy formation.

In collaboration with WHO, we have emphasized ARI as one of the key health areas for the 1990s. ARI is one of the major killers of children under age five, and to achieve any of the World Summit for Children goals, much work needs to be done in this area.

As in most other areas, the UNICEF program strength is mainly in the field. To reinforce our capacity at this level, we are training UNICEF field staff (many of whom are not health professionals) to be more knowledgeable about ARI programming and implementation. We are also encouraging field offices to support training of health providers at all levels of national health systems, as a way of increasing access to ARI case management.

From the family health care angle, ARI is a watershed. Immunization programs received a great deal of support because of their political visibility in the developing world. Immunization was one peg on which politicians loved to hang their hats because it was an area where success was likely. Now, having gotten on to the bandwagon of child survival, countries in the developing world see that there are certain other health problems that need to be addressed, and ARI is one of them.

Now where does this new initiative leave the existing primary health care programs? The stress on the village health worker is great. Today, we are developing techniques that village health workers can use to count respirations; we are teaching village health workers how to spot dehydration; we are teaching them to motivate mothers to bring children in for immunizations, and in the latest initiative on safe motherhood, we are again involving village health workers. It is very difficult to find several workers to do all these activities in one village. At the same time, it is difficult to imagine every village having a sufficiently knowledgeable person who can absorb all these messages and deliver them to the satisfaction of their community, and to the satisfaction of the donors, who are goal oriented.

Therefore, the gradual development of a polyvalent, credible health worker who can take up all these messages becomes key to delivering the wide range of health services successfully. This is the challenging concept that I am offering at this workshop.

DISCUSSION/COMMENTS

Session I

David Gittelman, U.S. Centers for Disease Control

How much is being done currently at WHO, perhaps in collaboration with UNICEF, for developing ARI service training and curricula for medical schools and nursing schools?

Response from Harry Campbell, World Health Organization

Nothing currently. Globally, we do not have the staff resources to take on curriculum development. We are planning towards the end of this year to start developing curriculum material for nursing schools. As you are no doubt aware, the CDD program has been developing curriculum materials and also an approach to curriculum development. We hope to learn from their experience. We felt it more important at this time to establish clinical training materials, and we have just developed a package for outpatient case management. We are field testing that package in the coming months, and are continuing to develop a package for ARI training units which would deal with both inpatient and outpatient case management. Additionally, we now have first draft materials for community health worker training, and we are going to be field testing that in three countries later this year. Once we have completed these training packages, we will start on the nursing curriculum development.

In some national programs, such as Pakistan's, they have decided to go ahead with curriculum development. They want to move ahead and build ARI into undergraduate training using the clinical training materials that we have already produced. Pakistan plans to adapt these materials and make use of the experience of the CDD curricula development at CDD to produce their own materials for undergraduate training.

Marjorie Koblinsky, MotherCare

What has WHO done in the area of infant warming, both in terms of the training manuals and any intervention experience in the field?

Response from Harry Campbell, World Health Organization

We have always recognized that chilling is an important risk factor in death from pneumonia in the young infant. In the last few months WHO has decided to explore this area more thoroughly. We plan on producing a review paper on fever. Half the paper will deal with treating fever and the importance of treating fever; the other half of the paper will deal with hypothermia and the importance of the preventing chilling in young infants. This latter section will review the available data that supports chilling as an important risk factor in pneumonia and death from pneumonia, and will review the methods that are available for preventing chilling in young infants.

For example, by collaborating with the MCH program at WHO, we have put together information on the kangaroo mother method, ways of keeping neonatal units warm and the use of heating pads and other methods for keeping infants warm. Warming, then, is really an area that we have recognized as important, and we are working to formalize the available data and information. We would certainly like to make use of the expertise within the MotherCare Project to develop a plan for the global ARI program regarding acceptable and effective methods of preventing of chilling.

Ann Van Dusen, U.S. Agency for International Development

I was intrigued by Figure 2 showing the rapid growth in ARI programs in the last five or six years. What struck me was the rapid growth in programs in countries where the IMR is under 40/1,000. It seems that the ARI programs are being implemented more rapidly in those countries, compared to countries where the IMR is higher. Could you speculate on why it is that there has been such a growth in ARI programs in countries with a relatively low IMR?

Response from Harry Campbell, World Health Organization

The number of programs in countries with a high IMR was 50% higher in 1990 than in 1989, so it is true that the number of programs is growing very rapidly in countries with a high infant mortality rate. I think that in this coming year the number of programs will again expand considerably in this group, because quite a number of African programs are now planning and setting technical ARI guidelines. However, there are also many countries with a low national IMR showing interest in ARI programs. This really reflects a national recognition that ARI is a problem, and a desire by the country to establish an ARI program.

I believe that most of the countries with a low national IMR probably have significant ARI problems because there are areas in these countries with high infant mortality rates. For example, China quotes an infant mortality rate of less than 40/1,000, but there are vast areas of the country with IMRs higher than 100/1,000. Therefore, I think it is entirely appropriate that these countries have ARI programs. It is also likely that in those countries with a better health infrastructure, the recognition of ARI as an immediate problem is perhaps more rapid than it is in some of the African countries. Of the countries with a high infant mortality rate that currently do not have ARI programs, over two-thirds are in Africa.

Nicholas Studzinski, U.S. Agency for International Development

During the WHO presentation passing mention was made of a study investigating the economic costs of prescribing antibiotics for ARI. Who is conducting this study, and where is the research headed?

Response from Harry Campbell, World Health Organization

I cannot elaborate greatly on that study. We recognize that this type of research is needed, and that we need to collaborate with the drug action program. We decided that we could collect some of the data through a health facility survey. However, there is a need also to look at government expenditure on antibiotics and cough and cold medicines. We had a meeting recently with the drug action program, and they recommended to us an economist with experience in developing countries and some background in ARI to conduct these types of studies.

Michael Deming, U.S. Centers for Disease Control

There is considerable overlap in sick children in the signs and symptoms used as indicators for diarrhea, ARI or malaria treatment. Among the children who have either fever, or difficulty breathing or diarrhea, a considerable proportion have two or all three of these symptoms. Presently, the health worker refers to three different wall charts, three different sets of protocols, and may need to apply all three simultaneously. I wonder if in the future those programs will come together so that protocols and wall charts will be developed to reflect the total "sick child." I can speculate that much is to be gained in terms of integrating these protocols and addressing more comprehensively what health workers actually see in the field; however, such a protocol could become quite complicated. I don't know if the advantages would outweigh the problems.

Response from Harry Campbell, World Health Organization

I know that this concept is a dream of Jim Tulloch, director of the CDR division. He envisions someday having an approach to the "sick child," or at least to the child who has cough, fever and diarrhea. However, operationally, this is some way off.

While there has been quite a lot of program experience using the case management approach for the child with diarrhea, we currently lack such experience in dealing with a child with cough and difficult breathing. We need much more program experience with the ARI protocol before we can ever integrate it with other treatment protocols. However, the link with fever and cough is a much more immediate one because it is clear that there is a clinical overlap between the presentation of malaria and ARI. It is clear that fever does have some effect on respiratory rate, which is one of the indicators of pneumonia in children. Currently, we are developing materials for community health workers that address fever and cough. We are taking this integrative approach very seriously, since the most commonly used antibiotic for pneumonia, cotrimoxazole, appears to also be an effective antimalarial for the *Plasmodium falciparum* parasite. However, we do hope to develop a more integrated approach to the child with cough, fever and diarrhea.

I should add that WHO is absolutely against the idea of training health workers in ARI, CDD, tuberculosis, malaria, dengue and EPI in a three day seminar. We stand absolutely against that. However, that is not to say that WHO does not think it is a good idea to move towards a more integrated case management approach to the three common symptoms of childhood illness.

Jerry Gibson, U.S. Agency for International Development

I was wondering if we could learn more about what UNICEF and UNIPAC are doing to ease the availability of specific ARI antibiotics for the poorer developing countries.

Response from Ranjit Atapattu, UNICEF

This is in the Bamako Initiative, which basically planned to develop some kind of self-reliance at the community level via a tripartite effort on the part of the government, the community and international organizations. There are some good examples in Africa, Benin and the Congo, and a few other countries where this initiative has taken root. The health systems in these countries are almost completely collapsed and there are no services or supplies available. Communities have come forward with this concept of self-reliance, and UNICEF, through UNIPAC supplies the medicines for local health programs to be paid in local currency. This relieves the government of having to dip into their foreign exchange reserves. We try to ensure a regular supply of drugs, and this is accompanied by training in the community management of basic health services, the delivery system and procurement.

Robert Breiman, U.S. Centers for Disease Control

Given the limited resources that are available for health care in general, and given that UNICEF and other agencies are already involved in the range of child survival interventions, could you see that resources will be shifting from the existing areas of emphasis to ARI, or are we in a phase where we can be looking for new resources? If we can expect new resources, where are those resources likely to come from?

Response from Ranjit Atapattu, UNICEF

Fortunately for UNICEF, in spite of the lack of resources all around, we have over the last five or six years had a fairly good growth rate as far as resources are concerned. We do not plan in the next ten years, for example, on withdrawing anything from the immunization program. The diarrhea and the ARI programs will continue to grow, and we feel somewhat confident that we will be able to raise the resources needed. The immunization program's success has attracted donors, and we hope the intense collaboration and success in ARI will keep resources forthcoming. I do not feel there needs to be much shifting of resources. Frankly, I think that we will have to convince countries to divert their limited resources from other areas into health.

SESSION II

USAID ARI Strategy

Jerry Gibson, U.S. Agency for International Development

Although A.I.D.'s ARI strategy is not in its final form, we are interested in learning what your perceptions are about the strategy at this time. I would like to start my discussion by reviewing the illnesses that constitute acute respiratory infections.

Overview of ARIs

Acute respiratory infections involve many different sites in the human respiratory tract, from the nose to the alveoli in the lungs, and every site in between. ARIs are caused by an array of bacteria, viruses and other agents.

Infections of the upper respiratory tract (the area above the glottis) make up the majority of the acute respiratory infections. The upper respiratory infections (URI) are due mainly to viruses, and often manifest themselves as colds. Presently, there are no drugs that can cure these viruses; antibiotics are of no treatment value, despite their enormous use by persons with colds or other viral URIs. Pharyngitis (sore throats) are also due mostly to viruses, and are not treatable with antibiotics. However, a certain proportion of cases of pharyngitis are due to the streptococcus bacteria, and are treatable with antibiotics. The big problem with strep-pharyngitis is that it cannot be distinguished clinically from a viral URI.

The incidence of upper respiratory infections in the developed world and in the less developed world is essentially identical. Many studies suggest that a person is about as likely to get a cold or a sore throat in Washington, D.C., as he is in Tanzania. However, the incidence of life-threatening lower respiratory infections, particularly the bacterial pneumonias, is many times higher in the developing world. URIs in the developing world often progress to pneumonia. The main issue, then, is how to prevent URIs in children under age five from progressing to life-threatening bacterial pneumonia.

Besides the URI's, the other major category of respiratory infections are the acute lower respiratory infections, such as pneumonia and bronchiolitis. The majority of these infections are not due to viruses, but are community-acquired bacterial infections. The WHO case management chart for children with cough or troubled breathing targets these infections. Pneumococcus and Haemophilus influenzae, the predominant bacteria causing the acute lower respiratory infections, are treatable using common antibiotics. Post-measles pneumonia is also treatable by the same antibiotics. Therefore, the prime element of any ARI case management program is dealing with the bacterial pneumonias.

The A.I.D. Strategy Objectives

The A.I.D. ARI strategy has three major objectives, bearing close resemblance to WHO's.

- The major objective is to reduce mortality in children under age five through improving access to good case management and the prevention of serious ARIs by immunization, and promotion of optimal breastfeeding.
- A.I.D.'s second major objective is to promote the integration of case management into the country's health care system.

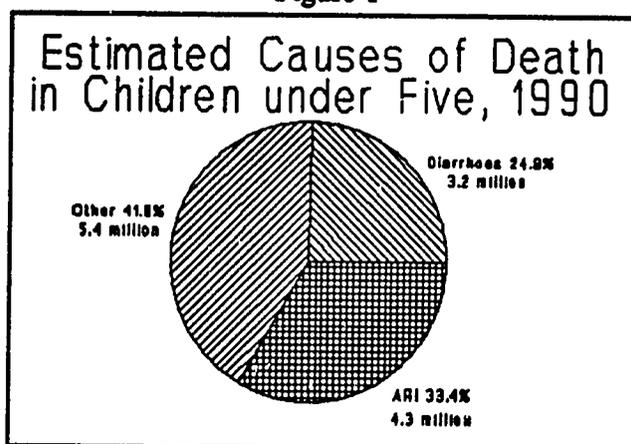
- The third objective is to look into other ways to decrease morbidity and mortality through primary prevention, reducing the risk factors for bacterial pneumonias.
- The fourth objective is to promote rational use of antibiotics and other drugs for ARI.

Formulating the A.I.D. Strategy

One of the early decisions made in developing A.I.D.'s strategy was to concentrate efforts on the case management of children under five with cough or troubled breathing. This emphasis is aimed at combatting the community-acquired bacterial pneumonias. Therefore, an ARI control program in the context of the A.I.D. strategy is really a bacterial pneumonia control program. We do not recommend at the outset that ARI programs also attempt to address pharyngitis and otitis media (an infection of the middle ear).

Why is the Agency choosing to pursue case management of bacterial pneumonias as one of the key elements of its strategy? How big is the problem? Figure 1 shows that a large segment of the 14 million estimated deaths in children under age five in 1990 were due to acute respiratory infections that could be addressed by the WHO case management algorithm.

Figure 1



To specify the Agency's ARI strategy, six major issues need to be addressed:

- 1) *Do we expect that ARI case management of children with difficult breathing is going to have an impact? That is, is it going to do more good than harm?*

Impact here refers to a reduction in the fatality rate from a particular disease or illness brought about by a health intervention. In order to reduce mortality from a particular disease substantially, there needs to be sufficient incidence of that disease in an area receiving the intervention. The consensus has been that in a country with an infant mortality rate exceeding 40 deaths per 1,000 live births, bacterial pneumonia is a sufficiently large cause of mortality in children under age five.

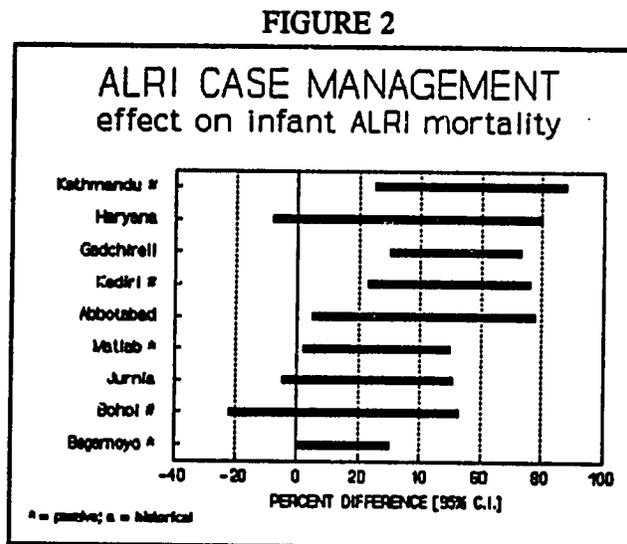
To achieve impact, a series of systems, that is, links in a chain must be present and working correctly. Impact requires that cases of bacterial pneumonia be correctly distinguished from those that are not. Health workers must be adept at employing the WHO diagnostic algorithm.

Also related to impact is the efficacy of the antibiotic treatment. First, there must be an adequate supply of antibiotics in the health center. Second, mothers must be taught how to give antibiotics correctly. There must also be a sufficient number of provider of antibiotics so that a reasonable proportion of the children with an ARI can receive the drugs.

Another important issue in impact is providers' interest. If health care providers are not interested in supporting an ARI program, or if they do not perform the case management algorithm correctly, there will be little, if any, impact on the disease. Parents, too, must be taught to recognize symptoms of ARIs, empowered to bring their ill child in for treatment and taught to administer the treatment correctly.

If each of these links in the chain is in place, then favorable impact is likely. Perhaps more than in the CDD or EPI programs, the high quality of each of the different elements of an ARI program is going to be essential to achieve a substantial impact. The A.I.D. strategy emphasizes quality of management and quality of care at each level.

Figure 2 is a graph from a paper by Mark Steinhoff at The Johns Hopkins University.



Steinhoff's paper reviewed the results of each of the nine major community clinical trials conducted to validate ARI case management for difficult breathing in young children. The graph shows the percent age reduction in ARI-specific mortality in children in an intervention group compared to those in a control group. All nine of the studies showed a reduction in ARI-specific mortality in the intervention group, and at least five of the nine showed a statistically significant reduction. These findings indicate that, when all the links in the case management chain are present and performed correctly, there is a substantial impact on ARI-specific mortality.

2) *If there is a favorable impact, what is the cost effectiveness of the program?*

There is very little data on cost effectiveness. In some of the trials reviewed by Steinhoff, there was an attempt to estimate what it cost in U.S. dollars to avert an ARI-related death. The crude estimates ran from around \$150 to \$300 per death averted. Figure 3 shows the World Bank's modeling for cost effectiveness in acute respiratory infection control programs.

Figure 3

INTERVENTIONS FOR ARI CONTROL:
SUMMARY OF CALCULATIONS OF EXPECTED COST-EFFECTIVENESS

INTERVENTION	Expected Disease-Specific Mortality Reduction	Proportion of ARI Mortality Addressed	Expected ARI-Specific Mortality Reduction	Under-Five Deaths Averted (Per Million Populations)	Cost U.S.\$ Per Person Served	Total Cost (U.S.\$) (Per Million population)	Cost U.S.\$ Per Death Averted
CASE MANAGEMENT	60%-90% (80%) (ALRI)	23%-78% (49%)	14%-70% (39%)	1470-4125 (2370)	\$3.15-\$8.51 (\$6.12)	\$280,000-\$1,000,000 (\$600,000)	\$177-\$421 (\$252)
BREASTFEEDING PROMOTION	10%-50% (30%) (ALRI)	4%	0.4%-2% (1.5%)	24-120 (90)	\$5.00	\$30,000	\$250-\$1250 (\$333)
EPI VACCINES	25%-64% (50%) (pertussis, measles)	15%-25% (20%)	4%-16% (10%)	240-960 (600)	\$9.08	\$122,580-\$245,160 (\$17,920)	\$128-\$1022 (\$363)
PNEUMOCOCCAL VACCINE	0%-30% (15%) (pneumococcal pneumonia)	30%-50% (40%)	0%-15% (6%)	0-900 (360)	\$7.28	\$98,280-\$196,560 (\$174,720)	>\$100 (\$489)
REDUCTION OF MALNUTRITION	50% (ALRI)	20%-30% (25%)	10%-15% (12.5%)	600-900 (750)	\$15.00	\$855,000	\$950-\$1425 (\$1140)

* Most likely values in parentheses

World Bank

They provide their best estimate of the cost per death averted for ARI-related deaths using the standard WHO case management, as well as for a variety of other ARI interventions. The World Bank's best estimate for cost per death averted is about \$250. That estimate suggests that case management may be the most cost effective of the different approaches evaluated.

- 3) *Even if the case management approach is cost effective to treat ARIs, can countries afford the cost?*

The answer to this question will vary from country to country. In the short-term, can the country find the money from external donors or from its own resources to get the program started?

- 4) *What are the prospects for sustainability in individual countries?*

Could these programs be sustainable anywhere in Africa? What about prospects for self-financing. Can an ARI program generate enough community interest and support to be able to pay a substantial part of its costs from patient fees? We know that most people in most LDC's are able and willing to pay therapeutic health care, including much ineffective care.

- 5) *Does an ARI control program fit in with A.I.D.'s policy? We believe that it does fit. Do the developing countries and the AID missions want ARI programs?*

Again, we believe that they do, although this may vary from country to country.

- 6) *How can we give the mission more of a notion of whether their country's primary health care system is ready organizationally to take on an ARI program?*

Many may feel that there should be a certain minimum level of access to some sort of primary health care clinic, and that there be an existing health staff ready to be trained in the case management of ARI. Additionally, it would be very helpful to have a system for distributing drugs or other medical supplies already be in place and operating that can be improved to the high level of quality needed to undertake successful ARI case management. Lastly, are the management skills there to make the program work in country?

In formulating the A.I.D. ARI strategy, we recognized that in different primary health care environments certain elements of the ARI program were going to be more or less difficult to undertake.

Figure 5 compares the primary health care systems of a country with a fairly well developed primary health care system, like Egypt, versus a country with a poorly developed system, like Nepal.

Figure 5

IMPLICATIONS OF LEVEL OF DEVELOPMENT OF HEALTH CARE SYSTEM	
High	Low
<ul style="list-style-type: none"> - Well-equipped hospitals and health centers - Drugs widely available and over-used - Physicians do most Dx and Rx - Many private physicians and pharmacies - Challenges: <ul style="list-style-type: none"> - provider acceptance and compliance - irrational drug use - antibiotic resistance - weak referral system - Example: Egypt 	<ul style="list-style-type: none"> - Few Hospitals poor access to health centers - Drugs unavailable in public institutions - Medical assistants and nurses do Dx and RX - Little private sector care - Challenges: <ul style="list-style-type: none"> - training uneduc. staff - drug distribution - cost of drugs - communication to mothers - no referral system - Example: Jumla, Nepal

Highly developed systems will have a referral system, including hospitals (though probably ill-equipped) and health centers; drugs will probably be widely available in the private sector, and perhaps the public sector, though some drugs, especially antibiotics, are probably substantially overused; physicians may do most of the diagnosis and treatment, making it a challenge to the ARI program to get them to give up some of their responsibilities to health workers; there is likely to be a well developed system of private physicians and pharmacies, whose roles will be threatened by an ARI program. A key challenge, therefore, will be getting the primary health care providers to accept the ARI control program. And, once they accept the program, ensuring their compliance in using the diagnostic algorithm and the simplified drug treatment protocol.

Compared with the well-developed system, a country with minimal development of a health care system will have little in the way of hospitals for referral, poor access to health centers, low availability of drugs, especially to public institutions, and perhaps poor distribution of drugs to private providers. Nurses, medical assistants and community health workers are likely to do the majority of diagnosis and treatment. In this health care system setting, we expect that it will be easier to retrain providers and gain compliance to the diagnostic algorithm and treatment protocol.

In these countries, the challenges are training an unsophisticated staff and getting a drug distribution program off the ground and running, particularly to the public sector institutions. An additional challenge is finding the money to cover the cost of drugs and supplies.

Strategy Emphasis

The Agency's ARI strategy focuses on five areas of emphasis to achieve its objectives: improved communications with parents, both at the general level of training them to recognize and promptly bring in a child with difficult breathing, and in communicating to the parent how to correctly manage their sick child at home, and how and when to bring their child in for a follow-up visit; maintenance of high quality case management through a system of effective problem identification and supervision; development of an appropriate information system to monitor the progress of the program, and if possible, to measure the impact or effectiveness using our routine data; development of an effective self-financing program with the cooperation of the physicians, pharmacists and others in the professional health care community, and promotion of the integration of ARI case management into the existing primary health care system.

The Agency is also interested in optimizing the communications and information sharing between the A.I.D. contractors involved in implementing the ARI strategy. I propose that we set up regular meetings at four to six week intervals to discuss any problems being encountered in any of the ARI program areas, and solutions that have been effective. Each meeting can feature an in-depth discussion of a specific topic, such as financing, supervision, quality assurance methods, motivating health professionals and integration of ARI activities into existing health programs.

Implementing ARI Control Activities

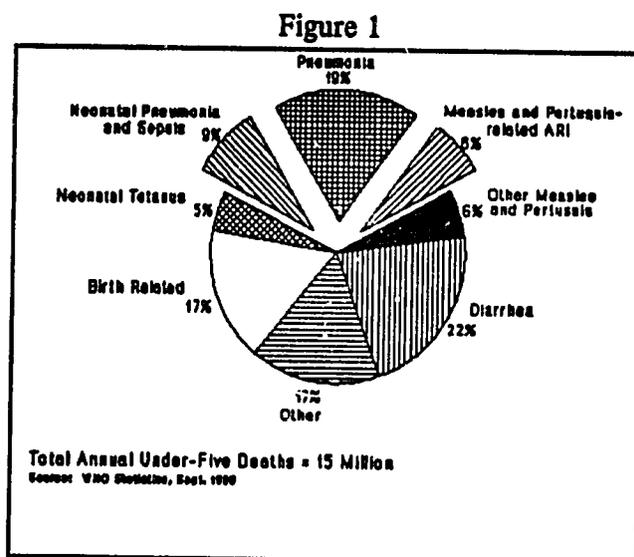
Nils Daulaire, REACH

The issue which is before us now is taking the A.I.D. ARI strategy, which is very close to completion, and turning it into programs. It is worth restating that what we are really addressing in any ARI strategy is implementing pneumonia control activities.

Background

ARI is well known to all of us. Those of us who have children of our own realize that it is as common in the developed world as it is in the developing world. Children in all parts of the world, both developed and developing, suffer from three to eight episodes of acute respiratory infections each year. The difference, then, between the developed and developing world countries is not so much in the incidence of ARIs as it is in the incidence of life-threatening pneumonia.

Figure 1 shows the importance of pneumonia in the spectrum of childhood deaths in the developing world.



Neonatal pneumonia and sepsis comprise about 28% of all deaths to children under age five. These are diseases which can be approached through case management. Measles and pertussis are dealt with both through immunization which prevents the development of these diseases, and also through case management of the disease complications when, and if, they develop. Approximately 80% of the pneumonias are caused by just two bacteria: streptococcus, commonly known as pneumococcus, and Hemophilus influenzae, commonly known as H-flu. Because we are not dealing with dozens of different pathogens, this tremendously simplifies the job of approaching implementation of pneumonia control programs.

Pneumonia is principally a deadly disease of infancy. Our study in the Jumla district of Nepal, as well as other studies conducted throughout the developing world, show that the majority of pneumonia deaths occur in children under age one. In Jumla, 70% of pneumonia deaths occurred in these young infants; the majority occurred before six months of age. It is clear, that in terms of programmatic implications, the focus of a pneumonia control program has to be on the first year of life.

Pneumonia Control Strategies

ARI control measures have two principal elements: the prevention of pneumonia and other severe ARIs and the case management of pneumonia.

In addressing prevention, we have to consider the risk factors that increase an infant's likelihood of developing pneumonia. Some of the major risk factors are: low birth weight; inadequate or untimely breastfeeding; protein-calorie malnutrition; vitamin A deficiency; neonatal hypothermia; indoor air pollution; overcrowding, and multiple prior infections. While this is a long list of risk factors to tackle in developing strategies to prevent pneumonia, several deserve particular emphasis.

Increasing birth weight. Child spacing and maternal nutrition during pregnancy are two major elements influencing birth weight. These problems are currently being addressed by the MotherCare project and other global programs, as well as through family planning projects worldwide. Exclusive breastfeeding is clearly an important element, including the feeding of colostrum. Early breastfeeding is an important element of intervention programs directed at preventing early childhood pneumonia.

Vitamin A supplementation. This is an area currently under considerable research. At this time, it is not clear whether vitamin A supplementation specifically reduces pneumonia mortality. Preliminary data from our research study in Nepal indicates that vitamin A may reduce the incidence of pneumonia.

Warming. Though research into infant warming is in its early stages, chilling appears to be an important risk factor for developing pneumonia in early infancy.

Indoor air pollution. Reducing indoor air pollution is an obvious preventive measure. To date, indoor air pollution has largely escaped effective interventions due to the complex set of factors associated with it.

Immunizations. The prevention of ARIs can be greatly aided through effective immunization programs. Approximately 25% of ARI deaths are, in fact, preventable with the current EPI vaccines. The measles vaccine, which primarily affects children over nine months of age, and the pertussis vaccine, which has its principal affect on infants over six months of age, are of prime importance in preventing ARIs.

ARI Case Management and Detection

Case management consists of the detection or identification of pneumonia cases and subsequent treatment with appropriate antibiotics. Simply stated, case management is finding them and treating them.

It is important to stress that, although there has been a major attempt to move as much of the primary health care interventions into the home as possible, there is no effective home remedy that can prevent an upper respiratory infection from developing into pneumonia, or that can adequately treat pneumonia. ARI prevention and treatment is a clinically based program where case management is the key. Only timely treatment with a full course of appropriate antibiotics will prevent pneumonia death once pneumonia has developed.

In terms of case detection, one of the great advances that has been made over the last decade in implementing pneumonia control programs has been the realization that x-rays, stethoscopes and laboratory tests are not necessary to make an accurate diagnosis of pneumonia. This realization has taken the issue of case management from being a highly clinical specialty requiring well-trained clinicians and well-staffed facilities, to an approach that could be more readily carried out in the community. Observation is the key diagnostic method for making the decision as to whether a child has pneumonia; eyes then, are the health worker's key diagnostic instrument. Health workers must be trained to accurately observe rapid breathing and chest indrawing in ill children.

Measuring rapid breathing. There are three respiratory rate elements. First if a child under two months of age is breathing 60 times or more a minute, then, by the WHO case definition (which has been adopted by UNICEF and USAID) that child is defined as having pneumonia. For a child between two and 12 months of age, the cutoff respiratory rate is 50 breaths a minute, and for a child between one and five years of age, the respiratory rate cutoff is 40 breaths a minute.

The initial protocol that was employed to classify children with rapid breathing used a respiratory rate of 50 breaths per minute for all children, regardless of age. This has been changed based on clinical observations of normal respiratory rates in children without pneumonia. In fact, children, when they are first born, breath more rapidly than older infants, and after the first year of life, the normal respiratory rate drops further.

In using a cutoff rate of 50 breaths a minute for all children, as was done previously, there was both an overdiagnosis of pneumonia in very young infants, and an underdiagnosis in older children. Still, in using the old respiratory cutoff, you would not be missing many of the potential deaths in the children over one year of age. And, in terms of the younger infants, the group at greatest risk of death from pneumonia, you only run the risk of treating more infants than actually have pneumonia. This is a small price to pay for the assurance that the vast majority of true cases are detected and treated.

Early diagnosis and treatment is really the key to averting a death from pneumonia. In our study in Nepal, we found that the average duration of pneumonia symptoms, prior to the death of a child, was only three and a half days; and in the very youngest, the duration was even shorter. Pneumonia is a critical illness which requires immediate response and rapid treatment. It is not a situation where you can wait several days before seeking care and before initiating treatment. The issues relating to timeliness really return to the issues of the mother's recognition of a problem in their child and their ability to take the proper action.

Effective and timely case detection requires a mother's involvement. They must play an active and early role in preventing death. This is not a small issue in traditional societies where fatalism is a widespread philosophy. Mothers and caretakers must recognize the symptoms of pneumonia. It is important that they recognize the difference between the symptoms of non-pneumonia ARIs and those of true pneumonia, so that the health system is not flooded by a demand for services and drugs for children who are not in danger.

Mothers also need to understand the importance of seeking health care when they recognize pneumonia in their child. If they do not go to the provider who has the antibiotics, the other elements of the case management algorithm will not contribute to the survival of their child.

There are three elements to pneumonia case management guidelines:

- 1) If you have fast breathing in a child under two months of age, or chest indrawing in a child over two months of age, this indicates that the child has severe pneumonia and requires urgent referral to a hospital for inpatient treatment.**
- 2) Fast breathing in a child over two months of age indicates pneumonia which should be treated with antibiotics. This can be done in the home or at the health center. Any indication of pneumonia in a child under two months of age is life-threatening. These are the children who die most quickly, and who are most likely to die. They should, if possible, be referred to a hospital for treatment.**
- 3) If the child has neither fast breathing nor chest indrawing, their problem is defined as a simple cough or cold, and no special treatment is required. Home care is advised, but it should be stressed that no particular form of home care has been proven to reduce the likelihood of a simple cough or cold from developing into pneumonia. What you are really doing in terms of home care is "treating" the mother. This is appropriate because an unsatisfied mother may not bring her child back the health facility when the child really requires acute care.**

Antibiotics for Pneumonia

The most commonly used antibiotics approved for treating pneumonia are cotrimoxazole, ampicillin and procaine penicillin.

Cotrimoxazole is, whenever possible, the drug of choice. It requires only twice daily dosing, and for those who have tried to give a child four daily doses of a drug, and wound up trying to figure out why only two and a half doses have gone in, this is an important issue. For mothers in traditional societies who spend most of their day working in the fields, you are more likely to get effective compliance with a drug that needs to be administered only two times a day. Cotrimoxazole is also very inexpensive. The cost of a full course of treatment in most countries ranges from as little as five cents to 20 cents. One problem with cotrimoxazole is that in many countries there is bacterial resistance to the drug. This issue must be addressed before launching a national policy on the selection of drugs.

Procaine penicillin has many advantages also. Because it is given by injection by the health worker, it does not require maternal compliance to ensure the medication is given. The injection is given once a day for five days. Administering procaine penicillin does require well-trained health workers and sterilization equipment. In countries where HIV is an important issue, the risks of an injectable antibiotic program may outweigh the advantages of a single oral daily dose.

In addition to antibiotics, health workers and pharmacists commonly provide cough and cold remedies to children presenting with ARI symptoms. Health Action International did a survey of 2,000 cough and cold preparations and found that a very high proportion were either harmful or ineffective. Additionally, many of these remedies are costly, posing a major drain on health resources both at the administrative and household levels. The current recommendation of WHO, which is supported by A.I.D., is that cough and cold remedies should not be actively discouraged, because they are a way of "treating" the mother. A mother must be satisfied when she leaves the clinic. This becomes an issue especially in the event that their child does not have pneumonia. When these preparations are provided to mothers, every effort should be made to use safe and inexpensive remedies.

Implementing Pneumonia Control Programs

There are six key areas in implementing pneumonia control programs: training; communications; supervision; logistics; monitoring, and evaluation.

Training. A key element is the training of program managers. Without people to run the program, without people who know the necessary elements, the clinical training of the individual providers often falls on infertile ground. In terms of clinical training, the most common method is the top-down approach.

The first level of training is usually for physicians and nurses in referral facilities. They are trained in full clinical case management. Subsequent to that first line health staff, the staff who first see the sick child in out-patient facilities receive training in case management. There are WHO training modules for both these levels of workers. The third level of training is for community and outreach health workers. In some cases they are trained only in case detection, so that they can identify pneumonia cases and refer them to the health facility. In other cases, where referral is not a viable option, full case management of the child with pneumonia has been effectively taught to community and outreach workers. Finally, an area which is just now undergoing considerable investigation is the use of community gatekeepers. These are generally members of the community, such as traditional birth attendants and lead mothers in mothers' groups, who can be trained to identify pneumonia when it occurs. This can help ensure the timely referral to a treatment facility or a health care provider.

I would emphasize that even in countries where hospital referral facilities are unavailable, and where there are no professional health staff, case management carried out by trained community health workers has been shown to have a substantial effect on reducing mortality. It is not necessary to have a health system in place to reduce pneumonia mortality. The intervention study in Jumla, Nepal, in which there was no existing health system, and in which the only case management was carried out by trained villagers showed, over a three-year period, a 28% reduction in total childhood mortality.

Communications. There are two elements of communications that are important. The first is education of mothers at the time of service delivery for appropriate follow-up care. This is both for mothers who have children with pneumonia who must return for follow-up to find out if their child is better, and to make sure that the antibiotics are being given appropriately. This education is also intended for mothers who bring in children with ARIs, but not pneumonia. The reinforcement they receive for their visit will increase the likelihood that they will return if and when pneumonia develops.

Second, education of mothers should take place at the earliest stages of a pneumonia control program. Every health service provider should be educating mothers as an integral part of pneumonia case management. Communications to enhance mothers' recognition of pneumonia and appropriate care seeking is key to widespread effectiveness of pneumonia control programs. However, a communication program should not be launched until case management services are widely available. It would be self-defeating to have a wide-scale communication program before health care providers have been trained in appropriate pneumonia case management, and before an adequate drug supply is available.

Supervision. The continuous assessment and upgrading of health care worker case management skills is the key to effective case management. One time training, "train 'em and forget 'em," results almost uniformly in bad case management after a very short period of time. Quality assurance is an essential element, whether it occurs under a rigorous format, or through a more direct provider-oriented feedback

system. Supportive problem solving, rather than policing, on the part of high-level supervisors and program management is necessary to keep the program smoothly operating. Often in primary health care there is an upward information flow system. Feedback to and from higher levels in the health system is an essential element of supervision.

Logistics. Trained health workers, motivated mothers and great supervision are all going to be meaningless if the necessary antibiotics and other equipment are not available. There are a number of technical areas within the antibiotic logistics system which need to be considered, such as forecasting of supplies, the costing and financing of antibiotics and procurement and distribution. Additionally, in cases where low-level health workers are providing pneumonia control, timers may be needed to measure respiratory rate. Lastly, in situations where there are hospital services, a logistics plan to ensure that hospital supplies, principally oxygen or oxygen concentrators, IV equipment and appropriate in-hospital antibiotics are available, is critical.

In terms of antibiotic costs, we have found that in a number of different countries that the cost of antibiotics required for a full, national pneumonia control program is often not significantly greater than current expenditures on a variety of antibiotics and cough and cold remedies. In the Philippines, for example, REACH looked at projected national needs for antibiotics and found that the current expenditures by the government health services on existing antibiotics and cough and cold remedies, if reallocated appropriately, would cover the entire projected national cost. It is also important to remember that household expenditures on various treatments for ARIs may significantly exceed government expenditures. This is particularly true in middle income developing countries in which the private sector is extremely well-developed and people are spending a lot of money. When considering available resources for a pneumonia control program, it is important to go beyond the public sector. There are many cases in which people could pay for some of the cost of their antibiotics.

Monitoring. To adequately monitor the progress of pneumonia control programs, you have to look at treatment rates -- both the numbers of treatments changing over time, and the link between this change and the observed quality of treatment. Antibiotic usage is key for both costing and monitoring of how a program is expanding. Referral rates are an important indicator in cases where there are good hospital facilities. And, when it is available, monitoring the effect of a child survival program can reveal whether the ARI program is having an effect on mortality.

Often, health services statistics are incomplete. In the Philippines, for example, the pneumonia incidence recorded by health services was 59 cases per 1,000 children per year, while a household survey carried out by WHO for the Philippines' ARI control program found that the actual incidence was 180 cases per 1,000 children per year.

Evaluation. In evaluation, you want to look at quality, efficiency (the appropriate use of resources) and effectiveness. Effectiveness translates very simply. Effectiveness results in little children growing up to be bigger children, and that of course is the basic goal of not only the pneumonia control program, but of all of the child survival interventions.

COMMENTS/DISCUSSION

Session II

David Nicholas, Quality Assurance Project

Nils Daulaire discussed not needing x-rays, stethoscopes to diagnose pneumonia, and equated rapidity of respiratory rate with pneumonia. What is the specificity and sensitivity of respiratory rate in relation to some kind of gold standard for diagnosing pneumonia? One reason for asking about this that children presented with fever from any cause will exhibit a rapid respiratory rate that is above the threshold for diagnosing pneumonia. Therefore, there will be a considerable percentage of cases that are treated unnecessarily for pneumonia.

Response from Robert Black, The Johns Hopkins University

Currently there is research being conducted on the sensitivity and specificity of respiratory rate. In comparison to gold standards of radiography or hypoxia, you get ranges of sensitivity and specificity of around 60%. These are not exceptionally high sensitivities and specificities, but I think they are, perhaps, reasonable and usable for the purposes of the program.

David Nicholas, Quality Assurance Project

When I was practicing overseas, I was struck by the inordinately high rates of pneumonia in children during influenza epidemics. Nothing has been said about this as a particular area where perhaps excess mortality is occurring during actual influenza epidemics. Does this raise a question of vaccination against viral influenza, and is there, in fact, any evidence that would support giving antibiotics to children during an influenza epidemic to prevent pneumonia?

Response from Jerry Gibson, U.S. Agency for International Development

If you review the work on etiologic agents of pneumonias and lower respiratory infections in children under age five, influenza per se has not been a common viral cause of life-threatening lower respiratory infections. I have not seen estimates of secondary bacterial infections following influenza in children under age five; this topic has not come up as a major area of investigation. Certainly in adults, what you may see is staphylococcal pneumonia following influenza, but this not a major component of community-acquired pneumonia in children under age five. Studies have shown that preventive antibiotic treatment given during a cold doesn't prevent future ARI.

Robert Steinglass, REACH

It seems to me that for ARI programs to be credible at the lowest level of the primary health care system, the program must address the overall supply and appropriate utilization of antibiotics. I think the first call on these drugs is going to be for adults with a variety of bacterial infections, and not necessarily for the children with ARI.

Response from Nils Daulaire, REACH

I think you are absolutely right. In the Philippines data, a large proportion of the antibiotics procured was being used to treat adults, and not only for bacterial infections, but for their coughs and colds. I think the standard practice, not only in developing countries, but in large portions of our own medical community here, is that when someone presents with a complaint, you have to treat them with something, and antibiotics are usually the treatment of choice. That is a difficult issue to address, particularly in mid-level developing countries where there is a strong medical profession and pharmacies. In some respects, it is easier in a place like Jumla, Nepal, where you are starting a health care system from scratch. One of the reasons we used oral cotrimoxazole syrup in Jumla, was that it was clearly perceived as a child's medicine, compared to tablets which can be used by anybody. This is a situation in which behavioral research, both of health care providers and of community members is going to be a very important element.

Response from Ranjit Atapattu, UNICEF

An important factor is the effectiveness of home remedies and of preventing colds and coughs from developing into pneumonia, I do not dispute the scientific evidence, but the concepts in the developed countries are very different from those in the developing world. For example, the question of bathing children, giving them warm water and herbal remedies, keep the mother quite occupied and happy, and in the long run may have some beneficial effect which we are not aware of. So, rather than looking for cheap cough syrups to satisfy mothers, we should investigate the home remedies which are available to third world mothers. Lastly, a point of warning. Cotrimoxazole is effective against many sexually transmitted diseases. Once the message gets across that this drug is available from village-based health workers, I am afraid there will be a drain on the scarce resources.

Martita Marx, PRITECH

Given the level of morbidity and mortality due to pneumonia, is A.I.D. considering a project specifically dedicated to pneumonia, or will ARI control programs continue to be distributed among bilateral projects and other centrally funded projects?

Response from Jerry Gibson, U.S. Agency for International Development

The A.I.D. strategy in this area is as follows: two years ago when the REACH II project was established, part of its mandate was to give technical assistance on a central basis for acute respiratory infections, as well as for immunization. So REACH is a designated central project providing technical assistance in ARI. But, we have other projects that deal with other child survival interventions, and their skills are also quite applicable to ARI. As for bilateral projects, if they request assistance in ARI, the Agency stands ready to help immediately.

I believe that ARI was put into the same project (REACH) that was continuing to give assistance in EPI as a first step towards integrating project services; A.I.D. is headed toward building projects that have more than a single intervention, and that will be able to give technical assistance on a wider range of child survival services.

Steve Redd, U.S. Centers for Disease Control

Where does ARI fit into the priorities of a country that does not have any health care infrastructure? Is ARI seen as a first intervention thing a country should undertake? Is ARI an appropriate first health intervention?

Response from Jerry Gibson, U.S. Agency for International Development

It is widely assumed that adding a new set of diagnostic skills to those already employed by health workers, is more cost effective than training a new cadre of health workers. However, this is not always true. If the existing health workers perform the new interventions poorly, and compliance is low, it may be more expensive.

Response from Nils Daulaire, REACH

There are many countries which would like to start programs. Each is at a different point along the spectrum of health services development. I think that ARI can fit in at many points in that spectrum. My own experience is that, in many respects, the traditional pillars of child survival – ORT and EPI – are not well appreciated by the communities they serve, because they are not curative services. Pneumonia is a dramatically curative service. ARI was introduced in Jumla as a first step intervention, and we found that it can serve as a valuable spearhead for other primary health care services. The other health services came as a result of subsequent demand from the community, but only after they saw that we had something to deliver that they valued.

Response from Harry Campbell, World Health Organization

It is not our place to decide when a country is ready for an ARI program. I think whether or not countries have ARI programs largely has depended on people in those countries recognizing the need and the ministry of health deciding it is time to act. Obviously, in most of these countries, there are existing EPI and CDD programs, and ARI will be added on. I think the type of ARI program that countries are capable of having will differ from country to country. I believe that because health staff already are spending so much time and resources on ARI, that it is now reasonable for any country that sees ARI as a problem, and whose ministry of health believes they are ready to start ARI activities, to begin a formal ARI program. It may not be possible for all countries to implement a program at the community level, but they certainly could benefit from other aspects of ARI programs.

Response from Ranjit Atapattu, UNICEF

Just a word on some of the preventive aspects of ARI that were mentioned by Nils Daulaire in his presentation. Vitamin A is one of the new tasks that UNICEF is undertaking as part of its immunization program. And, exclusive breastfeeding is another joint initiative with WHO which we are working to promote. Additionally, with the safe motherhood initiative gaining momentum, we hope that the low birth weight issue will be taken more seriously.

Michael Deming, U.S. Centers for Disease Control

I would like to express concern about the limitations of health facility-based ARI programs in sub-Saharan African countries. My concern stems from the CCCD experience with malaria. The overall malaria strategy has been case management. A good example comes from Togo, where the program began by trying to bolster good health facility-based treatment to ensure the drugs were there, and that health facility workers were adequately trained. We then conducted a survey which showed that only 20% of children with a fever were even seen at a health facility, and that only 3% of children with a fever were seen at a health facility on the first day of their fever. Like children with difficult or rapid breathing, children with a malaria also need to be seen promptly. So, in Togo, our intervention was applied to only three% of the target population – ARI programs could face this same limitation. One reason so few children are seen on the first day of their fever, is that there is no intermediate health workers at the community level. In acute project areas in sub-Saharan Africa, the only way to extend coverage is to either ask mothers to come to the health facilities more often, or turn to her to undertake the treatment. Interestingly, this latter alternative is already happening. At the time of the survey in Togo, 82% of mothers were treating their children at home with a modern antimalarial. Do you think that there is any possibility that mothers could be effective providers of treatment in countries where there is no village level health worker?

Response from Nils Daulaire, REACH

My personal feeling is that mothers cannot be effective providers of treatment for ARIs. Although case detection is not a complex process, the literate villagers that we trained in Jumla required nine days of training before they were adept at case detection and treatment. They then go out in the community and see an average of two to three cases a week. They are continuously reinforcing their case management training by what they see in the community. A mother will not have that experience. However, I agree with you that a facility-based case management program can be 100% effective in the children it sees, while only 3% effective in terms of the population. To improve this %age, better communications are necessary, and intermediaries in the community need to mobilize mothers and help them to recognize when they should bring their children in for treatment. In the best of all worlds, each village should have a community health worker stocked with the training and antibiotics carry out case management. However, for a variety of reasons, that is not likely to happen in most areas of the world in the near future. I am afraid that we are facing certain inherent limitations in terms of total effective coverage, and those can only be overcome as health systems expand into the communities that they serve.

Response from Jerry Gibson, U.S. Agency for International Development

The Agency's strategy is not going to be very prescriptive about the level of health care infrastructure it envisions are necessary before starting an ARI program. A.I.D.'s approach is to leave the decision making to the field; therefore, there will be a lot of room for individualization and trying different approaches. If the country and mission want to institute a program, then it will be done.

Response from Nils Daulaire, REACH

In Jumla, there is an element of success feeding on itself. The program was set up in an area where there effectively was no referral or health facilities, or health care providers to deliver ARI services. The whole program was launched using community workers. Every two weeks they would visit each household in their areas, look for ill children and treat them on the immediately. By the third year of the program, some 80% of the cases had been referred in by the health worker and the mother, up from only 15% at the beginning of the program.

Lani Marquez, LAC Health and Nutrition Sustainability Project

How much emphasis do the pneumonia control programs typically place on defining specific tasks for community health workers?

Response from Harry Campbell, World Health Organization

This really requires the program in a particular country to determine what is appropriate for the community health workers in that country to learn, and to use the modular training material to build the skills for community health workers in that country. While it seems likely that the community health workers will provide the bulk of care for ARIs, there are other community-based practitioners that may become involved, such as traditional birth attendants or pharmacists. However, WHO has never conceived of training the mothers in the case management of ARI because it would require taking them out of their homes for a week for training. But, again, it may be possible to use other groups of providers to increase access to the standard case management process.

SESSION III

Communication Support Services

Judy Graeff, HEALTHCOM

A good communication component is key to helping achieve the kinds of behavior changes that will ensure an ARI program has a positive health impact. Figure 1 shows a typical public health program divided into four main programmatic areas.

Figure 1

STEPS IN PUBLIC HEALTH PROGRAMS			
Typical health communications activities			
<u>ASSESSMENT</u>	<u>PLANNING</u>	<u>IMPLEMENTATION</u>	<u>MONITORING & EVALUATION</u>
observe behaviors, assess skill levels, survey and f.g.d for: knowledge, language, stated practices	select target behaviors, select target audience, select strategies, pretest messages and materials	training HWs, mothers, media campaigns, face-to-face activities, mobilization of volunteer groups	observe target behaviors, check clinic records measure awareness of program, survey knowledge
HealthCom ARI activities:			
Philippines _____		Honduras _____	

The kinds of activities described in this figure would be aimed at everyone involved in health care delivery programs as well as mothers. Observing behaviors, assessing skill levels, conducting focus groups and surveys to ascertain knowledge, language and stated, are all possible techniques for gathering information about practices of health care providers and mothers.

The Philippines Experience in ARI Communications

In the past, HEALTHCOM was involved in ARI programs in two countries -- Honduras and the Philippines. In Honduras, we worked mainly in the implementation and monitoring phases of their ARI program; in the Philippines, we were more involved at the assessment and planning phases of their ARI program.

In the Philippines, they were dealing with a fundamental problem -- mothers were presenting to clinics with children suffering from colds, while children were dying at home from pneumonia. The Philippines wished to clarify the focus of their ARI communication strategy and so needed data on what mothers were currently doing about ARI in their children.

Using a small observational study, we investigated three basic questions: what signs of ARI currently trigger referral action in mothers; what signs of moderate and severe ARI are they able to recognize, and how do they recognize those signs? We also investigated how well mothers and physicians agreed on the symptoms that they reported, especially in moderate and severe cases. We looked at 178 cases presenting at a hospital and several clinics in Pasai City, near Manila. Table 1 lists the symptoms or signs that bring mothers into clinics.

Table 1

Mothers' Reasons for Health Center Visit as Reported During their Interviews					
Reasons for visit*	Mild		Mod/Severe		Total**
	Number	Percent	Number	Percent	
cough	49	80%	86	74%	135
fever	20	33%	56	48%	76
blocked nose	29	48%	31	27%	60
diarrhea			3	3%	3
vomiting			2	2%	2
sore throat			1	1%	1
fast breathing			3	3%	3
chest indrawing			2	2%	2
noisy breathing			1	1%	1
blue lips			1	1%	1
convulsion			1	1%	1
loss of appetite	1	2%	1	1%	2
asthma	1	2%	1	1%	2
others	15	25%	39	33%	54
Total Cases	61		117		

* Multiple Responses
 ** Total number of responses of reasons stated for health center visits

The majority of mothers were bringing their children in for cough, fever and blocked noses.

The next question we examined was whether mothers recognized certain clinical symptoms, such as rapid breathing. In all, 26 symptoms were reviewed. Table 2 shows the mothers' responses from just six of these clinical signs.

Table 2

Table 2 Clinical Signs Reported by Mothers During the Interview								
Clinical Sign	Yes	Mild ARI		Moderate/severe ARI				
		%	DK	%	Yes	%	DK	%
cough	58	95%			116	99%		
noisy breathing	29	48%	2	3%	68	58%	2	2%
fast breathing	28	46%			82	70%	3	3%
chest indrawing	8	13%	1	2%	33	28%	13	11%
cyanosis	4	7%	1	2%	21	18%	3	3%
sore throat	5	8%	6	10%	15	13%	36	31%
Total Cases *	61				117			

* No response (NR) & Not Applicable (NA) are included in 178 cases

A large percentage of mothers were able to recognize fast breathing correctly, a critical symptom of pneumonia.

Table 3 describes the agreement between the mothers and physicians on what clinical signs they felt the children were exhibiting.

Table 3

Agreement Between Mothers' Responses During Interview and Physician's Observation of Symptom			
Clinical Sign	% Agreement	Total Responses	Kappa * Value
Rapid breathing	72%	89	0.50**
Chest indrawing	66%	99	0.67**
Cyanosis	84%	102	0.75**
Fever	72%	127	0.74**
Cough	97%	172	—

* indicates % agreement greater than chance
 ** Kappa values significant at $p = .01$

In this case the physicians saw the child in the same visit that the mothers were interviewed. The untrained mothers are simply explaining what they have observed in their child, versus the opinion of a trained physician. The Kappa value is a statistic that helps sort out how much of the percent agreement was greater than a chance agreement. Our values show an average agreement for medical signs.

Our conclusion from this study was that mothers can fairly reliably recognize rapid breathing in their own child, an important sign of severe ARI. A possible communications strategy, then, could strive to trigger health care-seeking behaviors in mothers when they see clinical signs indicating severity in their children. Additionally, we need to bolster the status of home treatment, and make this more gratifying to the mother. Another component of a communication strategy would be to train health workers in case management. A critical part of this training would be to reinforce mothers for proper referral. Even when mothers bring their children into the clinic for a cough or runny nose, it is important both to verify to the mother that those symptoms were indeed present, and to reinforce that she return to the clinic if and when rapid breathing develops.

Diarrheal Disease Support Services

Martita Marx, PRITECH

This presentation focuses on lessons learned in the control of diarrheal diseases that may be applicable in developing and implementing an ARI control program.

Changing Mothers' Practices

One of the problems that we have discovered in diarrheal disease control is that it is relatively simple to change mothers' knowledge of ORT, but it is an entirely different thing to change their practices. We also have found that those mothers who do use ORT make errors. Unfortunately those errors are made in one of the most critical areas in ensuring successful treatment: giving an adequate volume of ORS to the child. This phenomenon parallels the challenge for an ARI program of ensuring that the full course of antibiotics is given to the child for pneumonia. Likewise, mothers practice polypharmacy and use many ineffective or dangerous drugs even when the majority of diarrhea cases do not require antibiotics. This is also a challenge for ARI programs where current practice includes use of unnecessary antibiotics.

Changing mothers' practices is not a simple undertaking. Experience has shown the importance of understanding mothers' baseline belief systems and practices before developing appropriate and specific strategies to change their practices.

Changing Health Worker Practices

We also have found that health workers' knowledge about ORT is often adequate. However, many are not practicing correct case management. As with mothers, even when health workers prescribe ORT they continue other practices which are either ineffective, or in some cases, detrimental. Important areas of case management, such as communicating with and counseling mothers and nutritional interventions are lacking. Additionally, little information is given to mothers by health workers encouraging breastfeeding and referrals for measles immunization.

To change health worker practices, it is important to focus on preservice training. While it is important to train those who are delivering services in the medical care system, the turnover in any single facility is great, and a never ending pool of workers enter the system. If we do not change preservice training, our job will never be finished. Second, we have learned that it is important to question how training is done. Third, we are finding that training alone is certainly not sufficient to change practices. Programs must address not only the qualitative aspects of training, but the context in which health workers operate. We must seek more creative ways of addressing issues in selection, the training process itself, follow-up and the support structure within which health workers function.

Mortality and Morbidity Impact/Involving the Private and Non-Governmental Sector

If programs are to have an impact on mortality and morbidity, then we must extend our thinking beyond the public sector to other providers of care and to the other persons who influence the users of care. We must develop strategies to improve the care or communications delivered by non-governmental providers of services such as NGOs, traditional healers, pharmacists, fathers, and others. We must enlist the

assistance of the commercial sector and other groups for social good. For example, PRITECH has been working with soap manufacturers to start promoting soap for hygiene purposes rather than just for beauty. We should be creative about extending the reach of services if we wish to reach our mortality and morbidity objectives.

Comprehensive Care of the Child

Lastly, I would like to highlight an article that was in the November-December, 1990 *Review of Infectious Diseases*. The article, by Raman, et al., looked at hospitalized patients in Bangladesh. The article discussed the number of children who had diarrhea and pneumonia simultaneously. Many were also malnourished. Of the 441 children in the study, 77% were under two years of age; 88% were malnourished. There was a 14% case fatality rate among children with both pneumonia and diarrhea.

In such a context, we need to address the entire complex of the diseases facing children. For example, in both CDD and ARI programs if we forget to promote breastfeeding and correct infant feeding as part of case management, our efforts will be less effective. We must learn how to help programs develop national strategies and train and support health workers for these priority areas without losing sight of the whole child.

Programs and projects which focus on priority health issues should seek ways to cooperate, to share and use the lessons we have learned in each of our efforts. PRITECH, for example, has had much experience with the case management approach; PRITECH needs to share with ARI efforts, the lessons it has learned, its successes and its difficulties with the case management approach to reduce the mortality caused by diarrhea.

Immunization Support Services

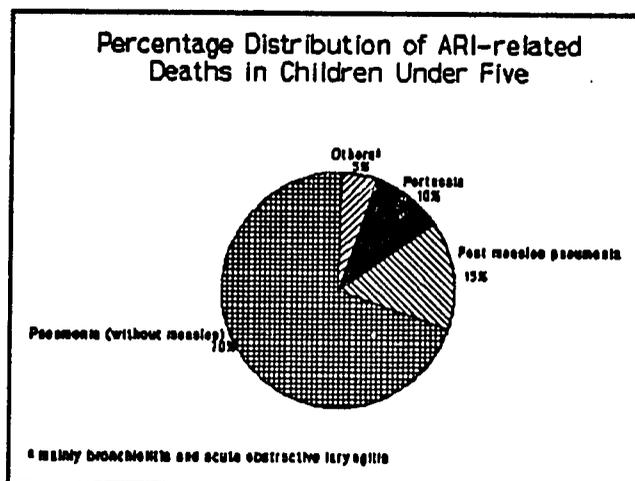
Bob Weierbach, REACH

When REACH began, its mandate was to provide technical assistance in immunizations and health care financing. Today, under its second contract with A.I.D., REACH II has a slightly different mandate. The project still provides technical assistance in immunizations, but now, we are also providing assistance in acute respiratory infections. REACH is funded through A.I.D.'s Office of Health, Health Services Division. A significant part of the funding that was allocated to this project comes directly from the country missions buying into the REACH Project. Therefore, the demand for REACH's ARI services must come from the A.I.D. missions.

Immunization: Key to ARI Prevention

Immunization is the number one preventive strategy for combatting ARIs. Figure 1 shows that, within ARIs, pertussis accounts for 10% of the deaths from ARIs, and post-measles pneumonia accounts for 15% of ARI mortality.

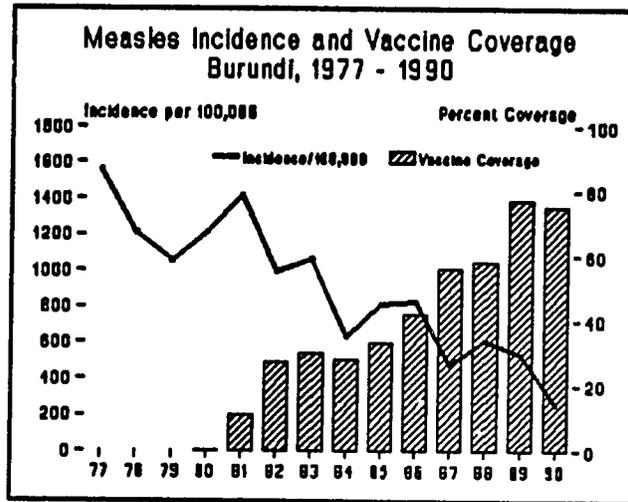
Figure 1



The main risk factors for pneumonia in children are malnutrition, low birth weight and the nasopharyngeal colonization of pathogenic bacteria. The fact that these bacteria are commonly prevalent, and are a normal part of the flora of the child's mouth, sets up children for this problem. The other risk factors that we may want to look at in the future include, exposure to chilling, exposure to air pollution, urban pollution, indoor biomass smoke from cooking and heating (a significant problem in developing countries) and tobacco smoke.

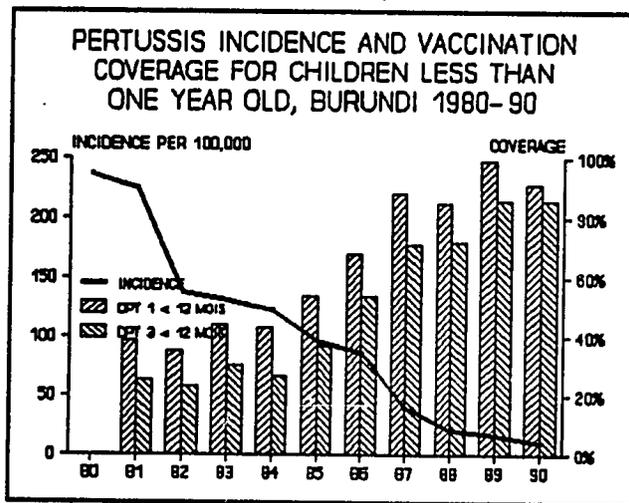
Much has been accomplished in disease control through the global EPI program. Figure 2 shows the significant progress made using immunization to reduce the incidence of measles in Burundi from 1977 to 1990.

FIGURE 2



The figure clearly shows that as measles immunization levels increased, the incidence of measles decreased. Figure 3 shows a similar trend for whooping cough.

FIGURE 3

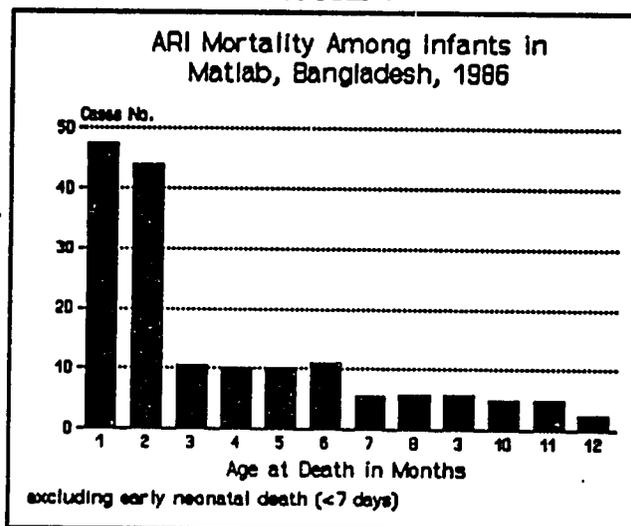


The 15% of ARI deaths related to measles and the 10% of ARI deaths related to pertussis can be significantly reduced by vaccination levels of 80% or greater.

An Unmet Need – Young Infants

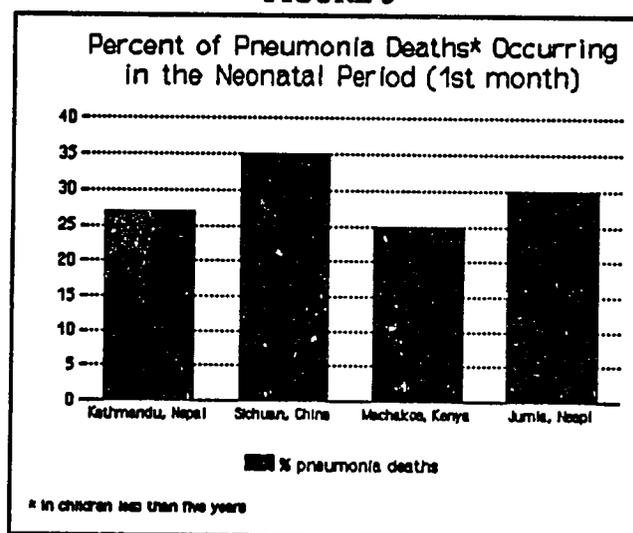
While there is little question about the effectiveness of vaccines in averting disease, the current dosing schedules do not protect very young infants, the group at greatest risk of death from ARIs. Data from Matlab, Bangladesh (Figure 4) show that deaths from ARI occur most frequently in children one to two months of age.

FIGURE 4



Some 45% of deaths in these young infants were due to ARI. Additionally, Figure 5 shows data from three countries illustrating that 25% to 35% of all pneumonia deaths occur during the neonatal period.

FIGURE 5



Bacterial ARIs: Developed vs. Developing World

The majority of bacterial pneumonias seen in the developing world are caused by two pathogens -- Streptococcus pneumoniae and Haemophilus influenzae. Figure 6 shows the carriage rate of streptococcal pneumonia in children under age five from both the developed and developing world.

Figure 6

NASOPHARYNGEAL CARRIAGE OF <u>STREPTOCOCCUS PNEUMONIAE</u> IN CHILDREN 0-4 YEARS OLD	
Place	%
Basse, Gambia, 1987	97
Maragua, Kenya, 1986	89
Goroka, PNG, 1982	97
Senegal, 1982	
- Dakar	82
- Rural Area	76
Goteborg, Sweden, 1981	28
Chapel Hill, NC, 1975	48
Charlottesville, VA, 1975	38

In developing countries, the percentage of children with streptococcal pneumonia ranges from 76% to 97%. In the developed world the percentage of children infected with streptococcal pneumonia is much lower, ranging from 28% to 48%. Figure 7 shows a similar pattern, of greater colonization in the developing world, for Haemophilus influenzae.

FIGURE 7

NASOPHARYNGEAL CARRIAGE OF TYPE B <u>HAEMOPHILUS INFUENZAE</u> IN CHILDREN 0-4 YEARS OLD	
Place	%
Basse, Gambia, 1987	10
Maragua, Kenya, 1986	9
Goroka, PNG, 1982	6
N. Wales, UK, 1986	1.1
Omaha, Nebraska, 1979	2.1

There are currently vaccines available against S. pneumoniae and H. influenzae. The problem with the streptococcal vaccines is that they do not confer an adequate immunologic response in children under age two. Therefore, this vaccine is not going to be particularly effective in ARI programs to protect the high risk neonates. Additionally, there are many different serotypes of streptococcus pneumoniae. To develop an effective vaccine for a specific geographic area would require determining what specific serotypes are circulating in the environment. This is very much beyond the current health technology capacities of

developing countries. Additionally, the streptococcal pneumonia vaccine is expensive, costing around U.S. \$10 a dose.

For *Haemophilus influenzae*, there is only a vaccine against type B. While it is effective in infants as young as two months of age, work still needs to be done to assess the vaccine's efficacy in younger infants. This vaccine is also expensive, costing around U.S. \$16 a dose.

Field testing of other vaccines is currently being conducted, but it is not anticipated that these vaccines will be available between now and the year 2000 for helping to control acute respiratory infections. Sloan, in a recent paper for the Australian College of Pediatricians, suggested that the approach that may have to be taken to protect newborns from bacterial ARIs is to immunize mothers, much as is currently done for neonatal tetanus.

Immunization is a very important part of ARI control, and countries that do not yet have an acute respiratory infection control program in place should be encouraged to strengthen their EPI programs as a first step in a national ARI program. This would help ensure protection of all children against DPT and measles. An effective EPI program can also ensure that any vaccines added to the program, to prevent pneumonia, in the future will quickly reach those in greatest need.

Quality Assurance Support Services

David Nicholas & Lori DiPrete, Quality Assurance Project

Strengthening ARI Services: A Quality Assurance Approach

The quality assurance field in the U.S. and internationally is going through a revolution, if not an explosion. There are currently major paradigm shifts in quality assurance that are going to effect the future of health care. At the very minimum, these changes may influence the type of work that we do in developing countries. They may also help to establish norms and set standards with the cooperation of country nationals. It is important that standards are not simply handed down; one should get a consensus within the country of what the norms and standards are going to be.

In the U.S., the total quality management approach that is used in manufacturing corporations is now being applied to health care organizations. This represents a major paradigm shift of how management of health care organizations and programs is being carried out. And, there is great application for developing countries as well. If you work with health workers and focus on quality, rather than on management, you can very often solve a great many of your management problems.

What is Quality Assurance?

There are five main characteristics of quality assurance:

- cyclical and continuous activities;
- data-based decision-making;
- a focus on process assessment;
- action oriented, and
- a team approach to problem solving.

Quality assurance is cyclical and continuous. I think the idea of incremental continuous improvement is very important. One must not tend to conduct large, external evaluations that leave 150 recommendations for a country to address. It is much more important to have every clinic, every district and every region involved in identifying their own problems, in finding solutions to those problems and in gaining the small successes day by day, and week by week that result in incremental improvement. That philosophy is one that is being promoted in developed countries as well.

Quality assurance also emphasizes the importance on monitoring quality with data. For program monitoring, we employ a small number of indicators. This is done on an ongoing basis. The indicators do not tell you if something is good or bad, it just tells you where you are. For example, what percentage of our health workers are counting respirations? Evaluation, on the other hand, implies a judgement. What is the relationship of something to a certain threshold? Evaluation then leads to problem identification. The team approach is critical to solving those problems that are identified.

Another important aspect of quality assurance is the focus on the process. Process in this context means that the team working in the program understands the process they are involved in.

How all this relates to supervision is something that is yet to be learned. The old hierarchical model of supervision has not worked well in the past in most developing countries; in many cases supervisors cannot even get out to the field. There is a great deal to learn about self-assessment by health workers and by teams at health centers, and their ability to solve problems themselves. Much of what has been learned about quality assurance in developed and developing countries can be applied to the ARI programs, but we have a long way to go to learn how to do it best in the developing country context.

Quality Assurance in ARI Programs

Why is quality assurance important for ARI control programs? First, because a clinical intervention is required that uses drugs, the services have to be of high quality. Second, managers of programs and providers of the services need tools and approaches that can help them identify and solve their own problems. Quality assurance stimulates internal action that will lead to problem solving. Finally, based on our Quality Assurance Project systems analyses, there are problems in ARI service delivery that are preventing the services from having their full potential impact.

Results for ARI Service Quality Evaluations

We conducted service quality evaluations in four countries – Colombia, Indonesia, the Philippines and Pakistan. A variety of methods were used to collect data, including observation of service delivery, record review, household interviews, exit interviews with mothers, interviews with health workers and observation of some supervisory visits. Interestingly, the variety of data collection methods used in each country reflected the variation in ARI treatment standards. This variation was perhaps greater than in any other service areas we have worked in. We believe that this is indicative of the current dearth of ARI programs. In many countries, the treatment standards recently established by WHO are not yet being employed.

Several problems were identified through the systems analyses:

- ARI-specific diagnostic tasks were often neglected. temperatures were taken, but health workers did not count respirations or ask about troubled breathing. ARI-specific tasks tended to be done less frequently;
- the classification of treatment by severity was problematic. There were many situations in which mild ARI was treated with antibiotics;
- although the treatment was usually explained, little emphasis was placed on the importance of giving the full course of medication to the child. This key piece of information was often omitted;
- there was a failure to discuss the danger conditions that signal when a mother should return to the clinic with her child for further medical care, and
- supervision and training were irregular and ineffective. Ineffective means that health workers did not respond to the specifics of the case management guidelines.

On the positive side, ARI programs in Colombia and Indonesia appear to be having an impact. The emphasis on ARI and the additional training were positive elements. Another positive element was quality training and supervision. The health workers could identify, classify, treat and educate as we all hoped they could.

A final conclusion from our experience with the Quality Assurance Project systems analyses is that managers can use supervision and training to improve quality. For example, in Indonesia, our colleagues identified the use of antibiotics to treat mild ARIs as a problem. Antibiotics were given in 54% of the cases of mild ARI, and home treatment was not discussed. To combat this problem, a letter was sent to all the supervisors and health workers reminding them about the proper treatment protocol. Following the mailing, inappropriate use of the antibiotics decreased to 26%. PRICOR II operations research studies include many other examples of successful attempts to improve quality. We expect that the Quality Assurance Project will continue to help managers improve service quality.

Breastfeeding and Neonatal Warming Support Services

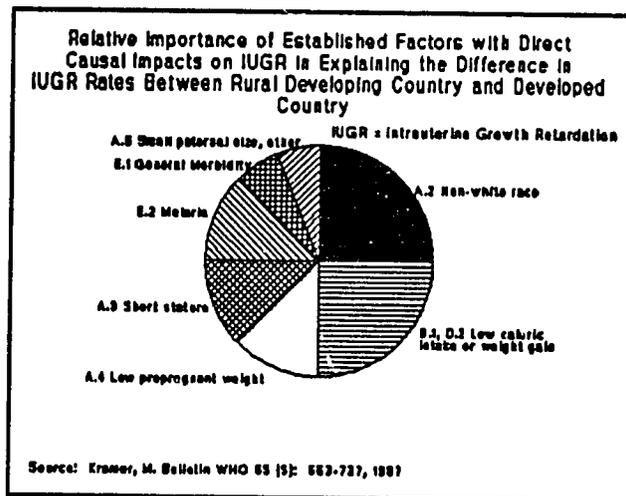
Marjorie Koblinsky & Nancy Sloan, MotherCare

The MotherCare Project aims to improve pregnancy outcomes for the woman and for the infant through a household or community-based approach. The project targets women during pregnancy, labor and delivery, and in the postpartum period. Additionally, MotherCare works to improve perinatal and neonatal outcomes.

Low Birth Weight

As seen in Figure 1, some 50% of the cases of low birth weight are strongly linked with maternal nutritional status, including short stature, low pre-pregnancy weight and low weight gain during pregnancy.

FIGURE 1



Reproductive Tract Infections (RTI) and sexually transmitted diseases, though extremely underreported, are also important contributors to low birth weight. To date, there have been only three population-based studies in the world investigating reproductive tract infections. Those studies found that reproductive tract infections were present in 22% to 96% of women surveyed. One study showed that the percentage of low birth weight resulting from RTIs ranged from 14% to 67%. These infections also cause premature birth, fetal wastage and congenital defects.

The MotherCare Strategy

MotherCare's strategy focuses on the prevention of low birth weight through improved maternal nutrition and a reduction in reproductive tract infections. Our first step with regard to improved nutrition for women, was to develop an anthropometric method to measure their nutritional status. At a maternal anthropometry workshop conducted in 1990, consensus was reached on some anthropometric measures. The findings of this workshop will be published in the October, 1991 *WHO Bulletin*; the workshop proceedings will be published by PAHO in August, 1991.

Activities to reduce reproductive tract infections have just begun. We plan on breaching to both policy makers and program officials the possibilities of integrating sexually transmitted disease programs with programs directed to women. Basically, we are looking at integrating services for syphilis and gonorrhoea with family planning and other programs directed primarily to women. Demonstration projects are currently being planned for Malawi, Haiti and possibly Uganda.

There has been a widely held view that prenatal nutritional supplementation for women does not increase birth weight significantly. This view probably stems from a 1982 review by David Rush that was based on developed country data. However, more recent studies showing a threshold effect in malnutrition in women are forcing this view to be rethought. Because of the threshold effect, you will see a significant increase in birth weight by feeding those women who are malnourished.

Table 1 shows data from three studies investigating the impact of prenatal dietary supplementation on birth weight.

TABLE 1

Threshold Effects on Impact of Prenatal Dietary Supplementation on Birth Weight Due to Maternal Nutritional Status		
Country (Source)	Threshold Effect/Groups	Mean Birth Weight Increase (grams) Supplemented vs. Control

Colombia	Low weight for height in pregnancy	180*
Herrera et al. 1980	Normal weight for height in pregnancy	22

Gambia	Wet season	200*
Prentice et al. 1987	Dry season	13

U.S.	Low triceps	262*
NY/Harlem	Skinfold prepregnancy	
Kristal & Rush 1984	Normal triceps	Not significant
	Skinfold prepregnancy	

* All birth weight increases in malnourished mothers were significant at $p < 0.05$.

Overall, the malnourished women receiving dietary supplementation had children with increased birth weights, whereas those women who were normal weight, did not show any significant increase in birth weight following nutritional supplementation. This effect is more obvious from the Indian data shown in Table 2.

Table 2

India - Impact of Prenatal Dietary Supplementation on Birth Weight in Various Studies		
Source	Sample Size	Mean Increase in Birth Weight (grams) Supplemented vs. Control
Girija <i>et al.</i> 1984	20	263 (food only)
Bhatnagar <i>et al.</i> 1983	294	170 (food only)
Vijaylakshmi & Usha 1981	80	820 (food+iron/folate) 280 (food only)
Qureshi <i>et al.</i> 1973	76	810 (food+iron/folate)
Iyengar 1972	110	298 (food + hospital rest)

* All birth weight increases were significant at $p < 0.05$.

These studies were conducted on malnourished populations of women. The data show that food supplementation brought about an 800 gram increase in birth weight. Additionally, supplemental food and iron given to a malnourished woman in her third trimester of pregnancy, also had a substantial impact on birth weight.

Managing Low Birth Weight Infants

MotherCare has been involved in two activities to manage low birth weight babies -- the early initiation of exclusive breastfeeding through national assessments and strategy formulation, and improved warmth and breastfeeding on demand.

Currently, MotherCare is working on a demonstration project in Guatemala investigating the effectiveness of using the case management approach for neonatal sepsis. In Guatemala, we found that 70% of neonatal deaths were due to the syndrome of sepsis-meningitis-pneumonia. Traditional birth attendants are being trained to communicate better with women. The aim is to make women more aware of the problems of sepsis, and to bring their babies into the health center for appropriate treatment and referral to a hospital. A simple method for mothers to remember the signs of sepsis using their hand was developed by Al Bartlett and Barbara Scheiber. The first finger of the hand is Cries. The baby cries and cries and cries, or is very sad and listless. The second finger is tired breathing. The third is too cold or too hot. Fourth is the baby does not suck, and fifth, the baby has fits.

The Kangaroo Mother Method

The Kangaroo Mother Method was developed in Colombia in 1979. In this method, low birth weight babies who are medically stabilized are held in skin-to-skin contact 24 hours a day. This gives the infant a ready source of breast milk and a steady source of warmth. This method was developed to reduce infant mortality by reducing hypothermia and the severity of respiratory infections in newborns. While there have been many types of studies done to investigate the effectiveness of this method, few randomized controlled trials have been conducted. Additionally, these studies were often weak due to small sample size and lack of quantification of measures.

The inadequacies of the data from these studies indicated the need for a well designed, randomized controlled study to assess whether the Kangaroo Mother Method is truly beneficial (or at a minimum, not more detrimental). MotherCare is now conducting such a study at the Isidro Ayora Maternity in Quito, Ecuador. However, biases in subject group allocation of previous studies and recent pretest data from our study indicate the Kangaroo Mother Method is not really a method to reduce neonatal mortality, but rather may improve neonatal health, growth and reduce costs of care.

Health Survey Support Services

Ties Boerma, Demographic and Health Survey Project

The Demographic and Health Survey (DHS) project is a large, worldwide survey program that conducts, or assists countries to carry out, nationally representative sample surveys. The surveys typically interview between 4,000 and 10,000 women of reproductive age. The DHS project began in 1985. To date, some 35 national surveys have been carried out; another 20 are planned over the next two years. The primary focus of the surveys is family planning and fertility, but data are also collected on child mortality and health. Specifically, the health section of the survey collects data on antenatal and delivery care, immunization, breastfeeding and supplementary feeding, child and maternal anthropology and morbidity. In some countries we also conduct verbal autopsies of children who died. These autopsies give some information about respiratory infection as a cause of death.

Specific ARI Survey Questions

Since ARI is a relatively new area of intervention, the questions related to ARI in the 1986 surveys were variable and not very clear. ARI questions became standardized in late 1988 when we conducted surveys in Egypt, Zimbabwe and Bolivia.

The current ARI question page asked about ARIs for all births to a woman in the last five years. The first question, "Has the child been ill with a fever in the last two weeks," is followed by a question on whether there was also cough in the last two weeks. We also ask about cough in the last 24 hours, and for how many days the cough lasted.

If a child did have an illness with a cough, we then ask whether he or she had rapid breathing. If a child had rapid breathing or a cough or fever, a series of questions is asked about treatment. What one would really like to know is whether the child got antibiotics, or another medication, or cough syrup. Determining what medication was given based on mothers' recall is very difficult. Mothers sometimes get small packets of medication without knowing what medication is inside the packet. We try to determine the type of medication by having the mother describe its consistency and color. Finally, we ask whether advice was sought for their child's illness, and where it was received.

Effectiveness of the ARI Questions

Recently, a study in the Philippines illustrated that the ARI questions in the survey were effective in identifying children with lower respiratory infections (Table 1).

Table 1

CRITERIA	SENSITIVITY (%)	SPECIFICITY (%)	
		Compared to URTI	Compared to non-respiratory illness
		Cough and Dyspnoea	84
Cough, Dyspnoea and Fever	82	58	79
Cough, Dyspnoea, Fever and Respiratory Distress Signs	68	83	84

Source: Kalter HD, Gray RH, Black RE, Gultiano SA. Validation of the diagnosis of childhood morbidity using maternal health interviews, *Int J Epidemiol* 20: 193-8, 1991.

Earlier work, in Gambia for example, did not show that these questions could effectively identify lower respiratory infections. In the Philippines it was found that when the history of cough measured by the survey was compared to a diagnosis made from a medical examination, there was an 84% sensitivity. This means that only 16% of the lower respiratory infections were missed using the survey instrument. For cough and fever, the specificity dropped slightly to 82%. However, if you add respiratory distress symptoms, such as flaring nostrils and chest retractions, then the specificity drops to 68%. While these specificities are not as high as we would like, we feel that on the whole they are good measures.

Prevalence of Cough and Dyspnea

Six surveys have been conducted since 1988 which used the standard ARI questions. Table 2 shows that the prevalence of cough in children under age five ranged from 40% to 50% in all of the countries.

Table 2

Prevalence of symptoms of respiratory illness in the last two weeks among children under 5 years in DHS surveys, and prevalence of cough and dyspnoea by ages in months									
Country	Year	N	Cough	Cough & Dyspnoea	Cough & Dyspnoea & Fever	Cough and Dyspnoea			
						0-5	6-11	12-23	24-59
Egypt	1988	7912	43.4	20.2	-	18.0	28.9	23.1	18.2
Sudan	1989-90	5771	47.0	20.3	13.7	20.8	26.1	21.7	18.9
Bolivia	1989	5161	41.2	20.4	-	22.9	25.9	26.0	16.9
Colombia	1990	3641	-	15.8	-	20.3	20.1	16.2	14.1
Paraguay	1991	3715	44.0	17.8	12.3	10.5	25.4	22.1	16.1
Zimbabwe*	1988	2940	49.5	7.7	1.2	9.2	10.5	8.5	6.6

Missing values and don't know responses excluded * Recall period 4 weeks

This is very unlike what we find with diarrhea, where there is an enormous range of prevalence values. If you then look at children with cough and dyspnea in the last two weeks, the prevalence is about 20% for all the countries. The only outlier is Zimbabwe, where slightly different questions were used. While I will not conclude that there is a universal prevalence of cough and dyspnea, there does appear to be some consistency between countries.

Treatment of ARIs

Table 3 shows the percentage of children in Zimbabwe, Egypt and Bolivia taken to a health facility for ARI treatment.

Table 3

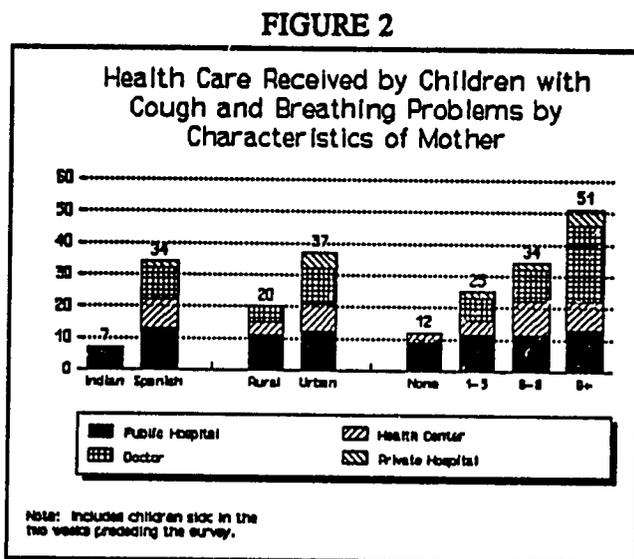
Percent of under-fives taken to health facility when having cough/breathing difficulties in the two weeks before the DHS survey			
Symptoms	Percent ill	Taken to health facility	
ZIMBABWE			
Any cough	49.5		53.9
Cough only	41.9		51.9
Cough with difficult breathing	7.6		64.9
EGYPT			
Any cough	43.7		45.0
Cough only	23.3		36.1
Cough with difficult breathing	20.4		56.2
BOLIVIA			
Any cough	43.9		22.4
Cough only	22.3		15.6
Cough with difficult breathing	21.5		29.5

Source: DHS Comparative Studies #4, 1991.

In Zimbabwe, 52% of children with cough only were taken to a health facility for treatment, whereas 65% of children with cough and difficult breathing were brought in for care. This difference is more marked in Egypt, where 36% of the children with a cough were taken in for treatment, versus 56% of children with a cough and difficult breathing. In Bolivia, the differential was 16% versus 30%.

Maternal Factors Related to Treatment

Figure 2 shows the type of health care received by Bolivian children with cough and breathing problems according to characteristics of the mother.



The data show that in Bolivia, 51% of the children of mothers with nine or more years of education were taken to a clinic; Conversely, only 12% of children of mothers with no education were seen at a health facility. I believe ARI programs should focus efforts on this less educated group.

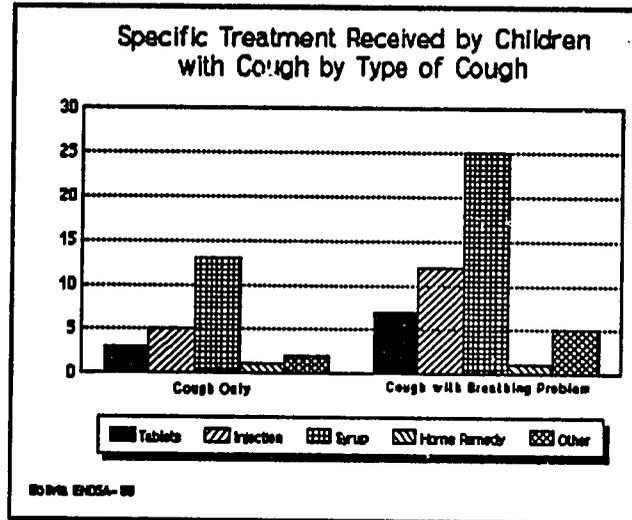
There are also enormous differences in seeking treatment according to area of residence, with 37% of children in urban areas being brought in for treatment, versus only 20% in rural areas.

These data are very important for program planning. They are often overlooked because we are predominately concerned with the biological or individual behavioral aspects of the disease.

Type of Treatment Received

Figure 3 shows data for Bolivia on the general type of medication actually given to the child in the clinic, based on mothers' recall.

FIGURE 3



Our questions only focused on the form of the medication, and not whether it was a cough syrup or an antibiotic syrup. For children presenting with cough only, 30% received a syrup (which may or may not have been an antibiotic), and 5% received an injection. In children with a cough and breathing problems, 12% received an injection, and 25% were given a syrup. Medicinal treatment is very difficult to measure from recall. Therefore, we are not convinced of the reliability of these data.

DISCUSSION/COMMENTS

Session III

Dorothy Stephens, U.S. Agency for International Development

Has MotherCare looked at the birth weights of subsequent children when the mother was given nutritional and iron supplements during previous pregnancies? Does the birth weight of the subsequent children born to such a mother increase?

Response from Mary Ann Anderson, U.S. Agency for International Development

To date, MotherCare has not looked at this. However, a study in Guatemala by Jose Villar et al. showed that the second pregnancy actually showed the biggest increase in birth weight. Mothers in that study were supplemented continuously for the first pregnancy, during the interval between pregnancies and then into the next pregnancy.

Harry Campbell, World Health Organization

We have been talking a lot about pneumococcus and Haemophilus influenzae today, but we should always be prefixing such discussions by saying this applies to children who are older than two months of age. We have reviewed many studies looking at the etiology of respiratory infections in the first two months of life, and consensus is that the laboratory methods used were not adequate to give an accurate picture. Similarly there are very few studies in developing countries examining the clinical signs of children with neonatal sepsis. As such, the global ARI program's single biggest research project is the multi-center study looking at clinical signs in young infants in the first three months of life. We hope that in 18 months we will have this data. This study also looks at etiology in the first two months of life, however we are not using lung aspirates. It remains to be seen how many diagnoses we can make, but we certainly should have much better information on the clinical presentation of young infants with neonatal sepsis. Our current recommendations, therefore represent the consensus view of a number of pediatricians who have experience in developing countries.

David Boyd, REACH

Has PRITECH or The Quality Assurance Project looked specifically at the ability of health workers to use the diarrhea case management chart?

Response from Martita Marx, PRITECH

We have that for the regular health worker, the chart is quite difficult to use. However, health workers with greater education and who have gone through the case management course, seem to use the chart with relative ease.

I think it is important to do what WHO has done to systematize the health worker's tasks in terms of diagnosis and treatment, but I really think that we, collectively as a group, have to look for ways to make things simpler for health workers to use.

Response from David Nicholas, Quality Assurance Project

The Quality Assurance Project just completed a field test of a supervision checklist for ARI in Zaire. Interestingly, the health workers there said that this field testing was the first time that anybody had ever come and shown any interest in what they do, or the quality of what do in health care. The supervisors themselves said that they never knew it was their responsibility to ensure the quality of care that is carried out by health workers. Nobody had ever trained them how to do it. At the end of the field testing, one health worker asked us to leave the simple supervisor's checklist so that they could know exactly what they are supposed to do when a child comes in with these symptoms of ARI. This list has six important tasks that health workers are supposed to carry out, including counting respirations and telling the mother to finish the treatment. Rather than going through a complex algorithm or chart, the list spells out the six things they have to do for a child presenting with an ARI. We need to look at the kind of job aids that would be most appropriate for health workers in different kinds of developing country situations.

David Nicholas, Quality Assurance Project

Does the MotherCare Project feel that the Kangaroo Mother Method is a good thing? Or is more research is needed?

Nancy Sloan, MotherCare

More research is clearly needed. We have no idea at this time if the Kangaroo Mother Method is efficacious or detrimental. I would say that it is not a method to be promoted at this time. All of the studies that have been done to date were poorly designed. The study in Quito, Ecuador, will be the first study that compares comparable children. The study will look at 700 children randomized into equal groups. Each group will be regularly followed-up through six months of age. We are just starting now to enroll infants in the final formal stage of the study, following pretesting and modification of the instruments. The results should be available in about two years.

SESSION IV

Applied Research and Assessment of Effectiveness in the Development of ARI Control Programs

Robert Black, The Johns Hopkins University

Applied research and program effectiveness studies are necessary and relevant to developing and improving ARI control programs. In the last several years, our faculty have assisted with more than 50 studies in 10 countries. These studies have been conducted for the following purposes:

- to determine useful information for developing a national ARI management algorithm, selecting ARI drugs, designing and training, and communication efforts;
- to determine efficient means to integrate ARI case management into the health system, including supervision, support services and drug availability, and
- to determine levels and trends in performance and quality of care to improve the ARI control program.

Recognition and Management of ARI at the Household Level

In this area, we clearly need to know more about the caretakers' perception of ARI, the words that are used to describe the symptoms and perhaps illness categories. We also need to know reasons why caretakers take their children to health facilities for care, the barriers against seeking care and what caretakers expect in terms of treatment. This related to their ability and willingness to continue a course of treatment. A study in Egypt found that a similar set of terms was used by health workers and by caretakers. However, these terms had different meanings to caretakers and health workers. So, even if the terms are the same, they may be used in very different ways.

In Bolivia, mothers did notice fast breathing in children, but they seemed to associate this much more with fever than with respiratory illness. We found that they did not recognize chest indrawing. We also found that mothers were seeking care rather late in their child's illness and there was widespread use of home remedies and traditional healers. This was also found in the Gambia.

Diagnosis and Management of Pneumonia and Hypoxia

A series of studies have been conducted related to the diagnosis of pneumonia and of hypoxia. These studies have included the medical signs and symptoms as well as the cultural terms for the symptoms. Studies have been done in Egypt, Thailand, Peru, Kenya, Colombia and Indonesia. These studies have been quite useful both in our understanding of the global application of the WHO case management algorithm, as well as in adapting it to the local setting.

One aspect of implementing the case management algorithm is counting respirations. This involves the use of timers and the recognition of chest indrawing by health workers. In Egypt, a study of primary care physicians found that when using timers, the respiratory rates counted over 60 seconds were more accurate than those counted over 30 seconds. In this particular setting, counting respiratory rates with timers was not really any better than counting them with watches. The primary care physicians in the study had not been through specific ARI training, making their recognition of chest indrawing quite poor. However, after participating in an ARI training session, they were then reevaluated. Their recognition of chest indrawing improved substantially.

Drugs to Treat ARIs

A major aspect of ARI programs is, of course, the use of antibiotics and pharmaceuticals and also many other drugs that are used for ARI. We recently began looking at the patterns of drug use for ARI by health care workers in Egypt and the Gambia; overuse of antibiotics and drugs in general by physicians is common. On the other hand, pharmacists in Egypt often provide appropriate advice and referral of severe illness. Studies of pharmacists in Thailand have recently been initiated.

Since use of antibiotics for pneumonia is crucial, we have recently initiated a study in Egypt to compare the acceptability and compliance with three formulations of co-trimoxazole. Other studies have been done of the most practical ways to manage children with wheezing.

Because presumptive therapy with antibiotics is the basis of ARI case management, knowledge of the antibiotic sensitivity patterns of pneumonia pathogens is important. We have helped the ARI program of Egypt to establish surveillance for H. influenzae and S. pneumoniae and to determine antibiotic resistance levels.

Training and Supervision

In training and supervision we are particularly interested in the development of training courses. In Bolivia, we conducted competency-based training, looking at very specific tasks that health workers and community health workers need to perform. A one-day refresher training course on ARIs increased the skill level of community health workers. Following the focused training program, they were able to appropriately classify ARIs and give proper treatment. In Thailand, a competency-based training course of one day resulted in the same level of skill and knowledge as the traditional two day course.

Assessment of Effectiveness of ARI Control Programs

Validation of questions for community surveys is very important. We need to measure the indicators at a community level, and we need methods to assess the performance of health workers. Additionally, methods are needed to assess the support systems of the ARI program including supplies and supervision.

Evaluation of Impact

Improved methods for verbal autopsies need to be developed. Validation of verbal autopsy methods has been conducted in the Philippines and studies of the mortality impact of the ARI programme being developed in Egypt.

The CCCD Project and ARI Control

Steve Redd & David Gittelman, U.S. Centers for Disease Control

The Combatting Childhood Communicable Diseases (CCCD) Project was begun about ten years ago as a joint effort of A.I.D.'s Africa Bureau and the International Health Program Office of the CDC. The objective of the project is to reduce child mortality by 25% in selected African countries through improvements in vaccination and better case management of diarrhea and malaria. Through the life of the project, 14 countries have been involved.

The strategies to effect a reduction in mortality through these disease control programs have been training, health education, surveillance and operational research. The program collaborated closely with African ministries of health, and CDC field staff stationed within the ministries.

ARI Control Programs in the CCCD Project

Because the scientific basis for ARI control was not well established when the CCCD project was formulated, ARI was not one of the diseases selected for control. Despite the absence of ARI control from the projects' original package of interventions, Lesotho's Ministry of Health convinced donors, including A.I.D., that the country needed an ARI control strategy. Surveillance data indicated that ARI was the leading cause of health consultations, accounting for about 40% of outpatient visits for children. Additionally, 25% of deaths to children in hospitals were attributed to pneumonia, making it a leading cause of death among hospitalized children.

As shown in the figure, Lesotho's diarrheal disease control project reduced the number of hospital admissions for dehydration caused by diarrhea over time, while the number of admissions for ARI remained about the same. A similar trend was seen for mortality in hospitalized children. There are a variety of reasons (besides the obvious burden of mortality) why Lesotho was an ideal country for the CCCD's first experience in ARI control. Lesotho is a small country, about the size of Maryland, with 1.7 million inhabitants. Their infrastructure is good, with well maintained roads. There is a functioning national drug supply system and a well established system for in-service training and health education. In addition, surveillance, supervision and management systems in the country that were put into place with CCCD support, could be adapted easily for ARI control.

The process of implementing ARI control in Lesotho does not differ from the experience of other countries. Programming must begin with review of current management practices at both health facilities and the community level. Policies and plans must be established, preferably with input from doctors and nurses from peripheral levels; they are the providers who will actually have to implement the ARI control strategy. Next, the program must be implemented, and this includes more than just one-shot training. Ongoing supervision must accompany the training. The program must be evaluated and operational research must be an integral part of that evaluation process.

Clearly, ARI is not the only cause of death in childhood. We need to be sure that our ARI programs complement and strengthen other child survival activities and strengthen them. There are opportunities for coordinating ARI control with other child health initiatives, and we should, at all times, keep the focus on the complete assessment of the ill child, rather than of a child with ARI alone.

Lesotho's ARI Control Program

Lesotho's Ministry of Health, with CCCD and UNICEF support, conducted four baseline studies before designing its ARI control program. Clinical studies reviewed how health workers currently managed children with ARI, and anthropological studies examined caretakers' perceptions of the importance of ARI, local disease terminology and treatment practices.

Staff from three of Lesotho's 19 health service areas participated with national level staff in a program design workshop. They were also given the responsibility for planning and implementing their own programs locally. Trainers, health educators and managers all coordinated strategies during these planning sessions.

The first year of the ARI program focused on the training and supervision of facility-based health workers in standard ARI case management. ARI and CDD program officers agreed to conduct joint supervision, however, ARI training remained separate.

The ARI coordinators preferred to focus on the technical aspects of ARI control when testing the new training materials. ARI training built upon what health staff already knew, rather than redefining or significantly reversing or adding to current clinical practices. This approach contrasts with diarrheal disease control training, in which a new technology, ORS, had to be taught.

Using adapted manuals, the program coordinators trained 80 nurses. The courses presented Lesotho's ARI control strategy and covered case assessment and classification, drug therapy and home care, education for caretakers and record keeping. Each course lasted two to three days, combining classwork with clinical practice. To ensure adequate hands on work, staff members tried to interrupt classroom sessions as necessary whenever children with ARI presented at nearby clinics. Nurses generally learned to assess and classify children with little difficulty. Some wished to continue using stethoscopes rather than counting respiratory rates in diagnosing pneumonia. Thus, the trainers had to reinforce the reasons for using respiratory rate rather than the stethoscopes.

Program Performance in the First Year

We monitored performance in 20 health facilities the first year. A checklist guided observation of case management, and helped review clinic management and drug stocks, emphasizing program coordination. The checklist also verified whether nurses checked for missing immunizations and for dehydration. The ARI and CDD coordinators reviewed clinic registers together, helping to record information needed for each other's program. They also took turns observing case management of children, ensuring that they assess for problems other than ARI or diarrhea alone.

In May, 1991, a first-year review team found a generally successful program in operation. In observing patient encounters and reviewing records, the team found that patient assessment, classification and treatment appeared to follow the Ministry of Health policy, but that parent education skills were weak. Only 3% of children classified with cough or cold were treated with antibiotics, but in seven of 16 patient encounters, nurses did not explain to mothers when to return to the clinic. These results may reflect the lack of attention the Ministry of Health gave in the first year to developing the program's health education component.

Staff interviewed were pleased with the program to date, especially with the lifted clinical decision making process. However, the referral system for severely ill children had not worked well. Some children classified as having severe pneumonia were not ill enough to need referral. Also, doctors could not always be contacted, and transportation was always a problem. Therefore, nurses usually treated these children as outpatients or kept them overnight at health centers for treatment. Nurses also wanted additional options, including alternative drugs, for managing patients when referral was impossible.

The review also identified several important issues:

- 1) The successful use of the WHO video on ARI case assessment suggested that counting the respiratory rate would not pose a significant technical obstacle;
- 2) Teaspoon size varied for administering antibiotic syrups, with spoon capacities ranging from two to four milliliters, instead of the five milliliters prescribed. Caretakers may have been systematically undertreating their children,
- 3) Verifying that examining clinicians and supervisors check for concurrent illness will be a major program challenge. In addition, nurses rarely dispense drugs to caretakers. This is usually done by pharmacy technicians and other staff without ARI training.

The review provided important lessons and recommendations for the ARI program as it prepares to be implemented nationally.

- Baseline studies together with wide participation in the planning process create program ownership especially among field staff who implement the policies directly.
- Given limited resources, planners should try to coordinate ARI control with other ongoing child health efforts such as CDD.
- The Ministry of Health must give priority to preservice training, and should orient doctors and hospital matrons early in the program. Training must include hands-on experience with actual patients, and must also involve those responsible for educating the patient.
- The Ministry of Health must formulate clearer guidelines on referrals and alternative drug therapy for severely ill children.

Lesotho's new five-year national ARI control plan is a phased control program geared initially to more populated areas, to those areas reporting the greatest morbidity and mortality due to ARI and to those communities with local interest in starting a program. Future program directions will emphasize continued training in case management, development of a health education component and incorporation of community health workers in program implementation.

The REACH Project Country Activities

Nils Daulaire, REACH

REACH II began its contract with A.I.D. nearly two years ago with a mandate to take on acute respiratory infections as part of its technical assistance program, in addition to its ongoing EPI component. The initial phases of that work were limited by the reality of the fact that A.I.D. had not yet established a clear policy on ARI. Therefore, much of our early activities have been related to building a strong foundation for providing technical assistance in ARI control programs.

An important element from the standpoint of A.I.D. and the REACH project was early coordination with other donors involved in ARI activities. We have consulted and coordinated very closely with WHO's ARI program, and have nurtured a productive relationship with them. Antonio Pio, head of the WHO ARI program, recently conducted an ARI managers' course for REACH staff. In addition, we have worked very closely with UNICEF on some elements of planning the upcoming International Consultation on the Control of Acute Respiratory Infections.

REACH's ARI Technical Assistance

REACH has carried out technical consultations in a number of countries. REACH sees several areas that are of primary strategic importance in building ARI programs. The first of these areas is costing and financing. A rather spirited workshop was held earlier this summer with a group of economists to discuss some of the financial costing implications of ARI programs. We recognize that the issues relating to the costs of drugs and the costs of the additional health services, as well as ways of financing those elements are going to have to be an important consideration in programmatic development in various countries.

A second important area is the issue of communications and ethnographic research. This really relates to what the mother and the community knows and understands, and how best to communicate with them. It is obvious from our own experience, as well as that of WHO and the Johns Hopkins University, that it is going to be critical to understand what the mother knows and understands. This understanding will bolster the internal awareness and acceptance of ARI programs.

A third area is the entire issue of quality of services in ARI. ARI, as the single most clinical component of child survival, requires continuous monitoring of the quality of services. Both REACH and the Quality Assurance Project are working jointly in looking at some of these issues. A consultancy in the Philippines is being planned for Fall, 1991, which will be jointly undertaken by the Quality Assurance Project and REACH to look at quality of training and other issues related to quality assurance there.

Overview of Country Activities

Nepal: The REACH Project has taken on the management of the Jumla acute respiratory infection intervention trial, now known as the Jumla Child Survival Project. This project was started in 1985, and has now moved into a new phase. We are trying to make use of the well-established, community-based case management approach as a spearhead for other primary health care interventions. Vitamin A and diarrheal disease control components have been integrated, and the project continues to monitor mortality.

The Philippines: Last year, REACH was involved in a consultation to the country's acute respiratory infections program to review their overall program and program management. REACH will be providing ongoing assistance in a number of areas relating to quality assurance, communications and education of mothers and training of health workers.

Nigeria: This is a fairly recent experience for REACH. One of our staff went together with a WHO CDD/ARI staff member to assist in developing a national plan for ARI. REACH plans on having long-term involvement in the development of ARI programs in several states in Nigeria.

Other Activities: We also assisted in a national programming exercise together with WHO in Kenya, and have been requested to do the same in Cameroon. An additional activity was a review carried out at the request of the A.I.D.'s Office of Health looking at some of the issues related to the packaging and product development of antibiotics in Egypt. We are in the process of fielding a team to Haiti to work both with government and non-government organizations to conduct some initial work in ARI programming. REACH staff has also done work with a number of PVOs in Bolivia looking at case management by community health workers. We have also been requested to work with PVOs in El Salvador. Lastly, REACH assisted the Johns Hopkins University Child Survival PVO Support Project in providing training for central PVO staff in ARI case management.

REACH has also just completed a review of ARI programs and activities for A.I.D.'s Latin America and Caribbean Bureau. The report will aid the bureau in making resource allocations and programmatic decisions in the region.

DISCUSSION/COMMENTS
Session IV

Robert Steinglass, REACH

On the one hand we hear that there is this great interest in ARI programs emanating from the field, and that this has spurred A.I.D. to move in the direction of developing an ARI strategy, while on the other hand we are aware that the A.I.D. Administrator is interested in paring down those areas in which the Agency is involved overseas to make the programs more effective. I am not referring simply to program in the health sector, but to programs in all sectors. There is a recent directive that A.I.D. missions must focus and target their areas of activity more. I am wondering to what extent at the A.I.D. mission level, has there been interest thus far in ARI?

Response from Jerry Gibson, U.S. Agency for International Development

Though the new A.I.D. policy is requiring that missions be involved in fewer projects, we believe that the control of ARI is important. We will make the case that this is one of those few things that missions should be doing. Also, we have not yet seen the full demand from the missions for ARI, because the ARI strategy paper is not yet in its final form.

Response from Mary Ann Anderson, U.S. Agency for International Development

In terms of the Agency's whole commitment to child survival, we continue to have the U.S. Congress as our main ally, despite our own internal debates on future directions. Our biggest concern in health is that we are finding that the field missions are not entering into bilateral health projects to keep pace with the money that the U.S. Congress is earmarking for child survival. Obviously, we cannot program all that money out of Washington. Therefore, we really have to get bilateral field projects going. As headquarters staff, we are seeking ways to stimulate field activities in ARI and the other existing child survival interventions.

David Nicholas, Quality Assurance Project

There has been a major change in health program emphasis over the last 10 or 15 years. When I first came into the health field, the big gurus of international health were Dick Jelliffe and Nevil Scrimshaw, and malnutrition was considered to be the central problem. It was thought that if you could solve the problem of malnutrition, much of the effect on mortality from diarrhea, respiratory infections, measles and other diseases would be reduced. We do not hear much about malnutrition anymore, especially when talking about children aged between six months and two to three years of age. We seem to have made a strategic decision somewhere that combatting malnutrition was maybe too difficult or too complex or that we tried for a number of years to combat malnutrition and could not do much about it. Now, we are going to disregard malnutrition and try to do something about the disease side of the vicious disease-malnutrition-disease cycle. We are now focusing on the treatment of pneumonia, which in some ways, back 20 years ago would be almost unthinkable. There has been a major shift now to disease-specific interventions and remedies and we will have to see whether this in fact effects the number of children who

go on to develop more severe malnutrition. Whether we will get decreased stunting of children, which is something that is the result of long-term malnutrition, we will have to see, but this is certainly a change.

I would be interested in A.I.D.'s view about how this shift in emphasis has come about, and how it is viewed at this time.

**Response from Mary Ann Anderson,
U.S. Agency for International Development**

My background is in nutrition, and I know what you are saying about the earlier emphasis on malnutrition and a seeming lack of focus on it now. I think that with the whole child survival approach, the thought was to do the easiest things first. Malnutrition is a very difficult problem because it is not solved simply with a pill given over five days; it is not one shot, or even three shots over six months. It is quite a long-term operation of getting enough food into the child and teaching the mother, and combatting the underlying poverty.

I think that the Agency is still quite committed undernutrition. I believe it is the Agency's commitment to combatting malnutrition that drives the food aid program. There are some new opportunities arising with the new Title III legislation. This legislation specifically calls on A.I.D. to show nutritional impact and increased household food security from the food aid program. Title III is selling the food and generating the resources for programming, and is not heavily involved in direct feeding. I believe there is still a group within A.I.D. that has definitely not lost sight of the importance of combatting malnutrition. We should not lose sight of malnutrition and move on to other areas, acting as if the problem has been solved. If anything, it is worsening as country economies weaken.

***Jerry Gibson, U.S. Agency
for International Development***

If we treat a child with life-threatening pneumonia and save its life, is there going to be any net effect on the probability of that child surviving a year down the line?

Response from Nils Daulaire, REACH

In terms of replacement mortality in the context of the Jumla study, we saw a negative replacement mortality effect. There was a smaller impact on the cause-specific pneumonia deaths than we had anticipated. There was about a 27% cause-specific mortality decrease, and a similar 28% decrease in child mortality. The children who were mostly dying of pneumonia both before and after our intervention were children under six months of age.

The major change in mortality that resulted from our program was in children between six and 18 months of age. Although there are alternative interpretations, this is clearly a program effect, because no other interventions were going on. What we are theorizing took place in our population, was that most of the kids who were really sick with pneumonia died anyway.

What we did in our intervention was to treat those children who would have been sick and fallen off the growth curve with pneumonia. Since response time with antibiotics is fairly rapid, we believe that the children we treated entered the risky period after weaning at six months of age (when diarrhea mortality soars), in better condition than the children who had not received antibiotic treatment for their pneumonia.

While there are alternative explanations, this one seems the most internally consistent. Pneumonia treatment may in fact be a preventive measure with a direct impact on nutrition.

**Response from Robert Black,
The Johns Hopkins University**

I would like to address the effect of ARI programs on mortality. I am currently involved in a meta-analysis of the ARI case management intervention trials using methods that derive great differences which you could attribute to the intervention. I think I could safely say that ARI programs have a real and consistent effect on both acute lower respiratory infection-specific mortality and on total mortality. This effect on total mortality is at least as great, and probably greater, than the effect on lower respiratory infection-specific mortality.

Closing Statement

Mary Ann Anderson, U.S. Agency for International Development

In closing the meeting on behalf of A.I.D., I would like to share some observations that struck me as particularly noteworthy.

1. **Next phase of child survival:** The increased involvement and interest in acute respiratory infections is very encouraging as part of child survival's continuing agenda of tackling the remaining "major killers" and pressing on with progressive action. Acute respiratory infections represent the more difficult side of child survival interventions, the part that was foregone in recent years to pursue easier interventions first, i.e. immunization and oral rehydration therapy (ORT), then latter build on that success to tackle other problems. Happily, we have now come to the stage where a solid foundation of success in strengthening the health system has been laid through immunization and ORT such that it is now possible to consider adding on ARI interventions.

2. **Stress prevention, not just cure:** Striking a balance between prevention and case management of ARI is very important. We must not neglect prevention and thus explicit links should be made in ARI programs to effective prevention strategies including:

- Immunization (especially measles and DPT)
- Optimal breastfeeding and weaning practices
- Improved maternal and child nutritional status and prevention of low birth weight

While A.I.D. is stepping up its activities in measles immunization and breastfeeding promotion, more attention is still needed and particularly in efforts to improve maternal nutritional status, reduce low birth weight, and improve child nutritional status. These programs need to come together with the ARI program which will require concerted cooperation of all involved.

Health systems approach. A health systems approach is needed because ARI intervention is not simple. It is not home-based and it cannot be solved by periodic campaigns. Thus we need to take on the whole health system, strengthen it and leave behind improved infrastructure. Specific aspects to be strengthened because time is of the essence in getting treatment to ARI cases before they become fatal (sometimes only a matter of hours) are:

- Referrals
- Links between home, health center and hospital
- Transport and communication
- Outreach to newborns/young infants.

I find the problems facing ARI programs quite analogous to those faced in maternal health care. ARI is similar to obstetric emergencies, where you do not have any warning regarding who is going to have a problem, but once there is a problem, fast action is paramount to ensuring survival of the mother and infant. All levels of the health system must work in harmony. Currently, they do not.

4. **Treatment must be integrated:** As stressed today, the reality is a "polyvalent health worker" who is responsible for delivering many different interventions and thus vertical approaches is not going to be effective. Thus, we should consider developing integrated training versus a strict ARI algorithm. Specific disease interrelated to ARI which were mentioned at the meeting are malaria, diarrhea and measles. Links between various health projects represented here and the lessons they have learned in the areas of communications for behavior change, quality assurance, training and supervision, rational drug use and newborn care should also be fostered.

5. **How much health infrastructure?:** The debate on how much health infrastructure is needed before implementing an acute respiratory infection project was intriguing, i.e. is there some minimum level needed first or can the ARI program be introduced to strengthen a weak health system. Nepal's experience with using the dramatic curative effect of antibiotic treatment for ARI infections to win community confidence and support for more preventive, long-term, less tangible infections was particularly encouraging.

6. **Targeting countries:** Regarding the assumption that a certain level of "readiness" must have been achieved before countries get into AIR programs, it was disturbing to learn that two-thirds of the countries without ARI programs are in Africa. This is compounded by the false perception of some that ARI is not a problem in Africa. There is a real need here to not let the ARI-program remain totally country-driven, but rather for some advocacy and leadership on the part of the donor community to get more countries interested. The upcoming international conference on ARI in December should go a long way towards the kind of stimulus needed.

7. **The role of mothers:** What can mothers do at home in ARI programs. Despite the clinical nature of the intervention, there is still a key role for training mothers and other child caretakers and achieving behavior change in terms of:

- Recognition of symptoms
- Timely care-seeking
- Compliance with antibiotic regimen

When mothers bring children with colds to health centers who don't need antibiotic treatment, there is a unique opportunity to work on counselling on preventive measures the mother can take, such as immunization, breastfeeding and weaning practices, growth monitoring, etc. Let us not "over-complexify" clinically-based approaches and lose sight of the mother. The idea of one mother as the community gatekeeper also seemed promising.

8. **Reaching newborns:** Because of the high proportion of pneumonia deaths in the first 2 months of life, a substantial challenge will be reaching these very young infants. This will require getting more involved during pregnancy and delivery to establish rapport with the mother and the birth attendant and to train them in symptoms and response to ARI. Otherwise it will not be known where and if there are

newborns in the community and mothers and others will not have been trained in time to take appropriate action in the critical early weeks.

In closing, I would like to thank the REACH project for organizing this meeting and bringing us all together, and special thanks to Ann Yanoshik and Michael McGunnigle who have really done the lion's share of the work organizing this workshop. In a sense this was not truly an orientation or beginning since we are building on a lot of work in the past five years. However, I do look forward to seeing the ARI program grow, especially with the impending release of the A.I.D. ARI strategy, the upcoming International Consultative Conference on ARI and planned, periodic coordination meetings.

ANNEX 1

AGENDA

**ARI Technical Orientation Meeting
July 31, 1991
Arlington Hyatt Hotel
Mary Curtis Room
Arlington, Virginia**

- 8:30 a.m. Arrivals/Coffee**
- 9:00 a.m. Opening Remarks** Diane Hedgecock
REACH
- 9:15 a.m. Welcome** Anne Van Dusen
R&D/H
- SESSION I**
- 9:30 a.m. WHO ARI Control Activities** Harry Campbell
WHO/CDR/ARI
- 10:00 a.m. UNICEF ARI Control Activities** Ranjit Atapattu
UNICEF, PHC Unit
- 10:30 a.m. Discussion/Comments**
- SESSION II**
- 11:00 a.m. USAID ARI Strategy** Jerry Gibson
AID/R&D/H/HSD
- 11:30 a.m. Implementing ARI Control Activities** Nils Daulaire
REACH
- 12:00 p.m. Discussion/Comments**
- 12:30 p.m. LUNCH**

SESSION III

- 1:30 p.m. Support Services**
- **Communications** Judy Graeff, HEALTHCOM
 - **CDD** Martita Marx, PRITECH
 - **Immunization** Bob Weierbach, REACH
 - **Quality Assurance** David Nicholas & Lori DiPrete, Quality Assurance Project
 - **Breastfeeding and Neonatal Warming** Marge Koblinsky & Nancy Sloan, MotherCare
 - **Health Survey** Ties Boerma, Demographic and Health Survey Project

2:30 p.m. Discussion/Comments

3:00 p.m. BREAK

SESSION IV

- 3:15 p.m. Country Presentations**
- **Egypt** Robert Black, The Johns Hopkins University
 - **Lesotho** Steve Redd & David Gittelman, U.S. Centers for Disease Control
 - **Nepal, Philippines, Haiti** Nils Daulaire, REACH

4:00 p.m. Discussion/Comments

4:30 p.m. Closing Statement Mary Ann Anderson, RD/H

ANNEX 2

**ARI TECHNICAL ORIENTATION MEETING
JULY 31, 1991**

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