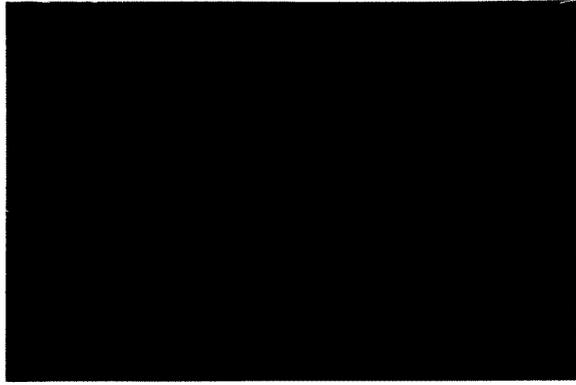


RESOURCES FOR CHILD HEALTH

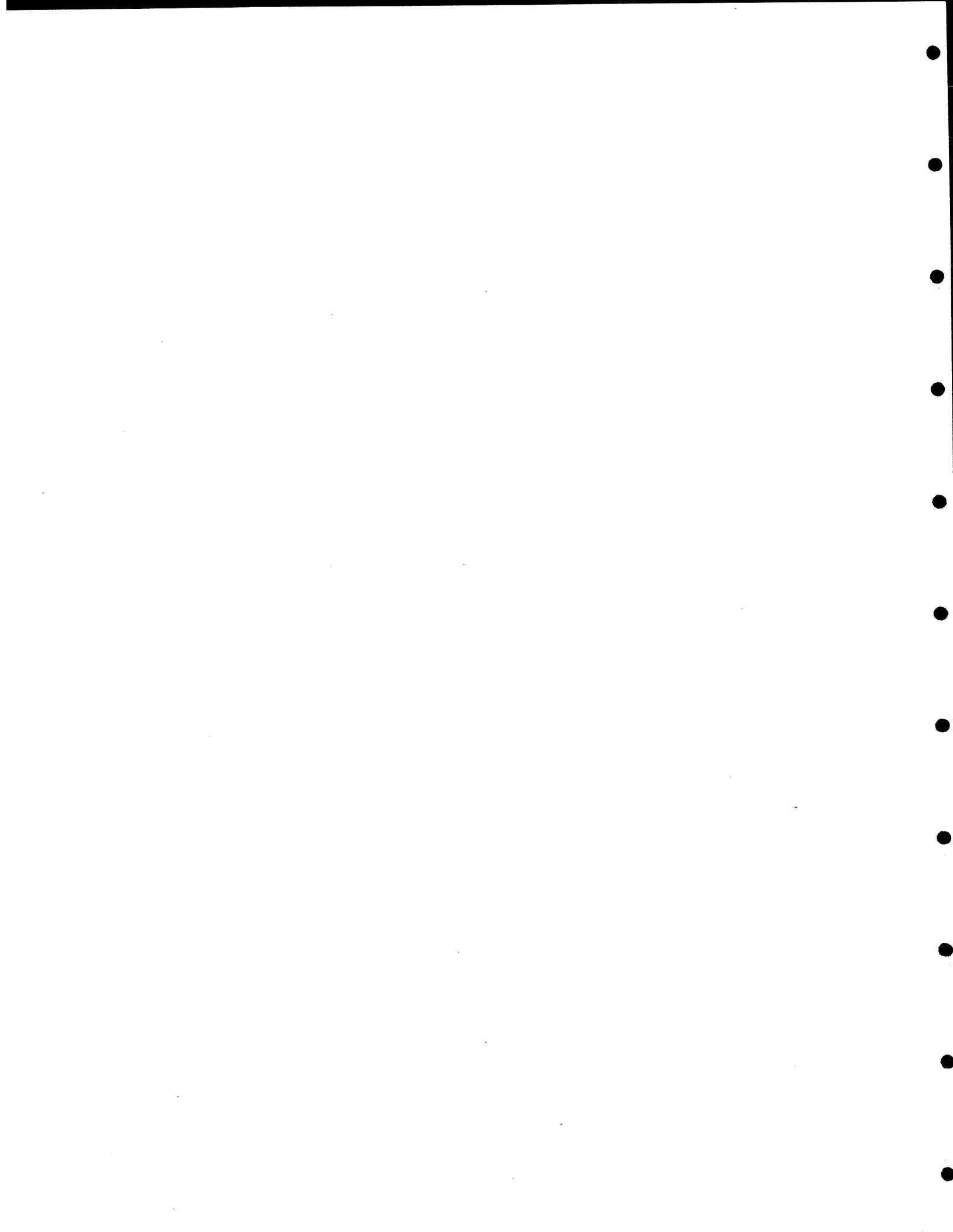


**REACH II
LESSONS LEARNED
ON IMMUNIZATION
AND CONTROL OF
ACUTE RESPIRATORY
INFECTIONS**

January 1994

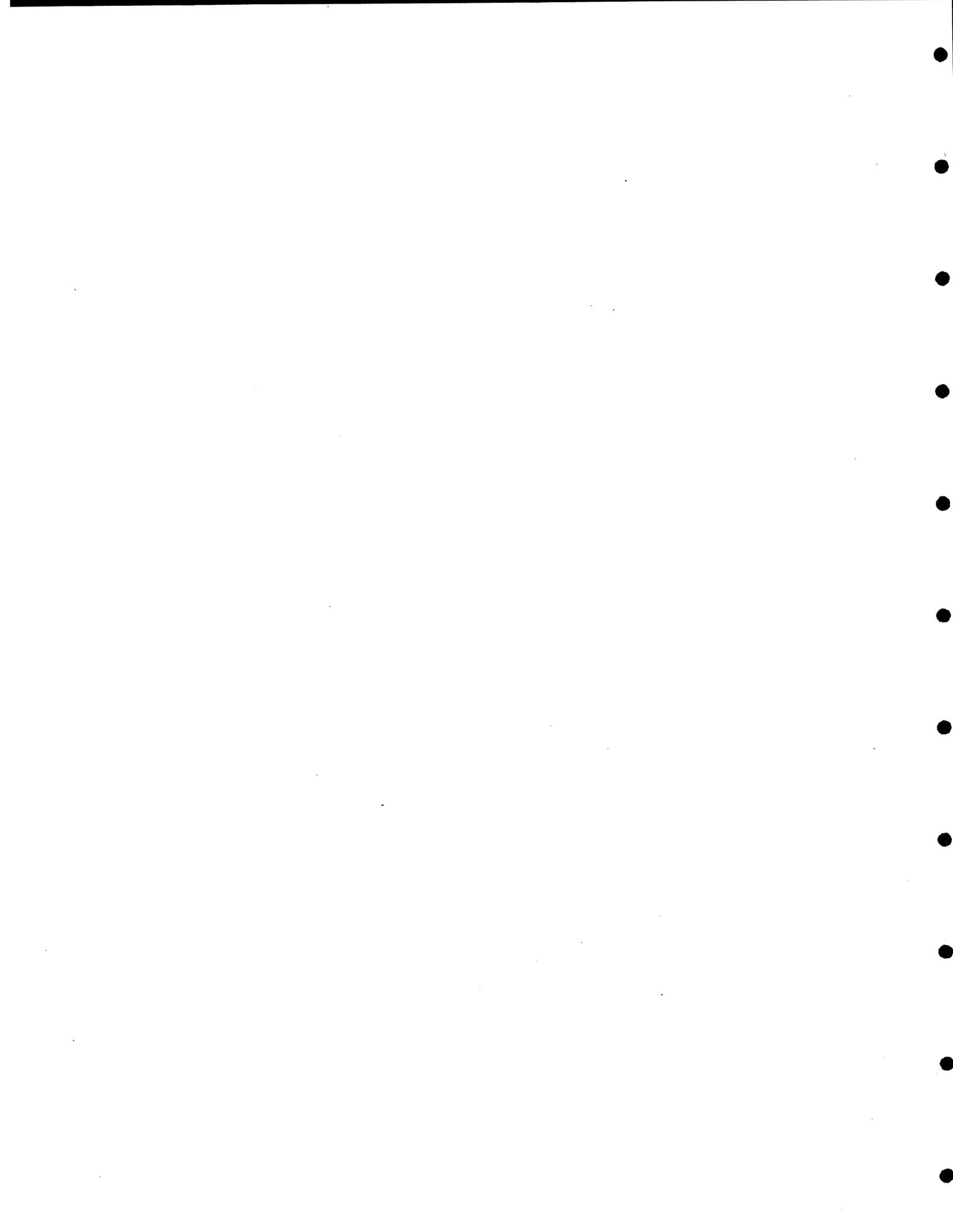
The Resources for Child Health (REACH) Project
John Snow, Inc.
1616 N. Fort Myer Drive, Suite 1100
Arlington, VA 22209

A.I.D. Contract No.: DPE-5982-Z-00-9034-00



CONTENTS

Preface	i
Lessons Learned Papers:	
1. <i>"Engaging in Policy Dialogue and Improvement,"</i> Donna Paine, Michael Favin, Robert Steinglass, Rebecca Fields, and Robert Weierbach	1
2. <i>"Reflections on REACH Immunization Program Assistance to the Former Soviet Union 1992-1993,"</i> Robert Steinglass	14
3. <i>"EPI/ARI Strategic Financial Planning: Lessons Learned from the Philippines,"</i> J. Brad Schwartz	34
4. <i>"Management Information, Monitoring and Supervision to Improve Quality of Immunization Programs,"</i> Mark Weeks	63
5. <i>"Workshop on the Control of Acute Respiratory Infections"</i>	72
6. <i>"The Children of Jumla, Nepal: Reduction of Child Deaths and Pneumonia Cases through Pneumonia Case Management and Vitamin A Supplementation at the Community Level,"</i> Nils Daulaire	97
7. <i>"Community Health Workers and ARI: Implications and Complications,"</i> René Salgado	118
8. <i>"Use of Standard Case Management among Bolivian Health Professionals Treating Acute Respiratory Infections,"</i> René Salgado, Victor Lara, Nils Daulaire, and Michael Favin	126



PREFACE

REACH (Resources for Child Health) is a global project of the U.S. Agency for International Development (USAID) to provide technical assistance to immunization programs and programs for the control of acute respiratory infections (ARI). REACH is implemented by John Snow, Inc. (JSI) and its subcontractors: PATH (for technology introduction), The Johns Hopkins University (for research), and The Manoff Group (for communications). The current REACH Project began in October 1989, and most activities ended in September 1993. However, selected activities, particularly in the New Independent States of the former Soviet Union, will continue through March 1994.

USAID is committed to improving child health in developing countries and has repeatedly identified immunization as the most cost-effective child survival intervention. Through REACH, USAID has worked with national immunization programs, helping them build systems to deliver immunizations, improve program management, increase cost-effectiveness and cost-recovery, adapt programs more to community needs, coordinate effectively with the private sector, and reach high-risk groups.

USAID also assists efforts to prevent the four to five million children's lives lost each year to respiratory infections, particularly pneumonia. Small-scale projects have shown the feasibility of reducing pneumonia deaths through the primary health care system. REACH has assisted ARI programs implement the standard case management approach developed by the World Health Organization.

REACH has worked intensively in the following countries:

- **Bolivia:** Long-term assistance in planning and staff training in ARI control, particularly for nongovernmental organizations.
- **Haiti:** Long-term assistance in EPI management, coordination, and cold chain/logistics; a pilot project for ARI control.
- **Kenya:** Long-term assistance in EPI communications, monitoring and surveillance, and measles control.
- **Kenya, Burkina Faso, and Niger:** Demonstration projects to control measles (with USAID's HealthCom and Quality Assurance Projects).
- **Georgia, Kyrgyzstan, Moldova, Tajikistan, Turkmenistan, Uzbekistan:** Emergency immunization assistance in procurement (vaccines, supplies, and equipment), training, program development, and assistance in reviewing/revising standard immunization policies and practices.
- **Nepal:** Support to ARI and vitamin A interventions and for data collection and analysis in a child survival pilot project.
- **Nigeria:** Major project to strengthen EPI service delivery in urban Lagos.

- **Philippines:** Technical assistance to the EPI (introduction of hepatitis B vaccine, cold chain/logistics, program evaluation, strategic financial planning) and to the national ARI control program (training, monitoring, supervision, and communications).
- **Yemen:** Training of primary health care staff, EPI planning, and monitoring and surveillance.

REACH has also provided short-term technical assistance in such countries as **Bangladesh, Cambodia, Cameroon, the Dominican Republic, El Salvador, India, Madagascar, Morocco, Nicaragua, and Tanzania.**

As most REACH activities drew to a close in the summer of 1993, REACH staff undertook a series of papers on lessons learned during the past several years. These papers--intended primarily for our colleagues at USAID, WHO, UNICEF, NGOs, and other USAID collaborating agencies--are not meant to systematically summarize the totality of REACH experience. Rather, they analyze selected technical or managerial areas in which REACH has worked.

The papers included in this series are the following:

- Engaging in Policy Dialogue and Improvement
- Reflections on REACH Immunization Program Assistance to the Former Soviet Union, 1992-1993
- EPI/ARI Strategic Financial Planning: Lessons Learned from the Philippines
- Management Information, Monitoring and Supervision to Improve Quality of Immunization Programs
- Workshop on Control of Acute Respiratory Infections
- The Children of Jumla, Nepal: Reduction of Child Deaths and Pneumonia Cases through Pneumonia Case Management and Vitamin A Supplementation at the Community Level
- Community Health Workers and ARI: Implications and Complications
- Use of Standard Case Management among Bolivian Health Professionals Treating Acute Respiratory Infections

These papers are available together in one volume and individually. The last four papers listed (on ARI) are also available in a separate volume.

January 1994

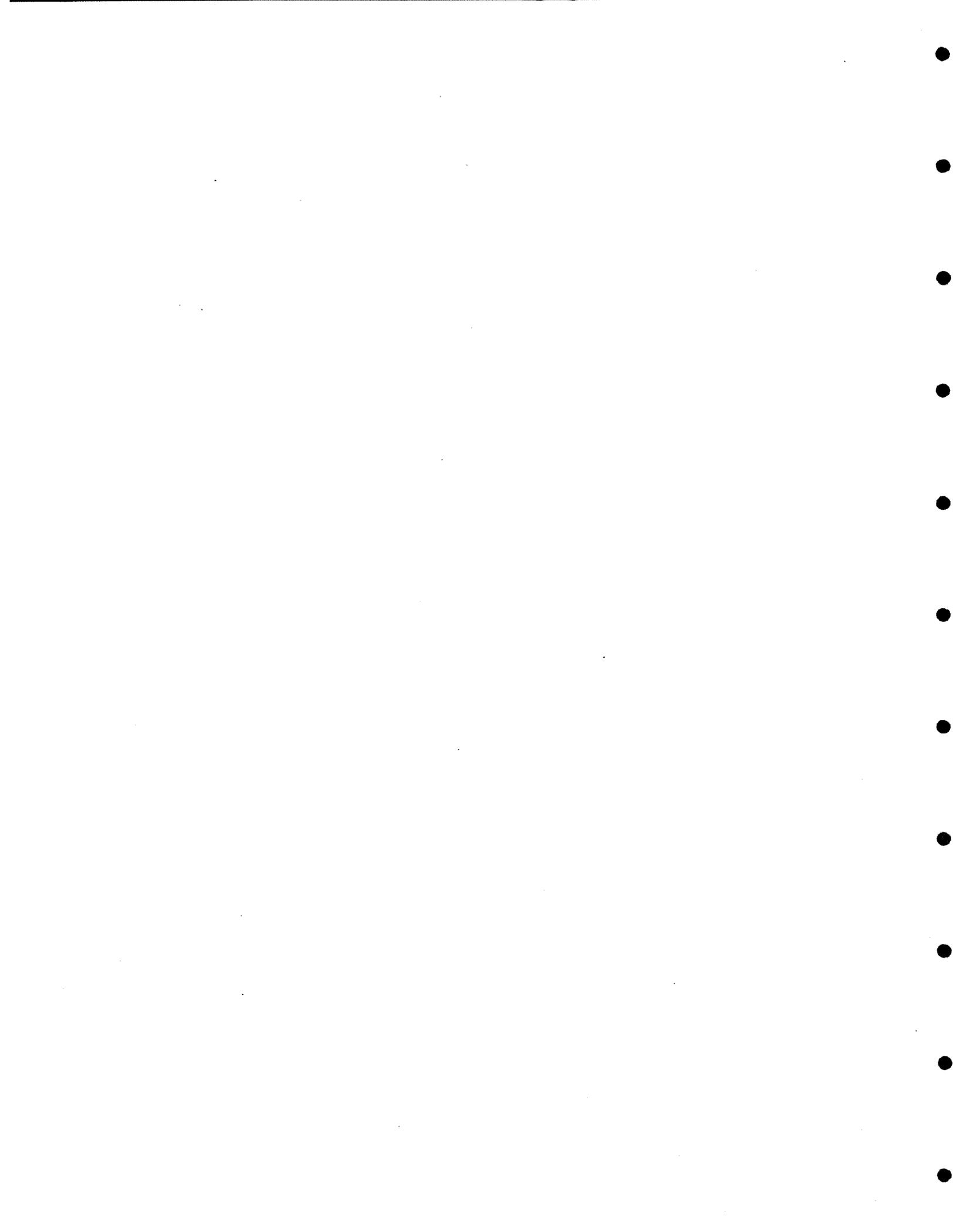
-1-

**ENGAGING IN
POLICY DIALOGUE
AND IMPROVEMENT**

Donna Paine
Michael Favin
Robert Steinglass
Rebecca Fields
Robert Weierbach

The Resources for Child Health (REACH) Project
John Snow, Inc.
1616 N. Fort Myer Drive, Suite 1100
Arlington, VA 22209

A.I.D. Contract No.: DPE-5982-Z-00-9034-00



I. INTRODUCTION

The Resources for Child Health (REACH) Project is a global technical assistance project funded by the Office of Health of the U.S. Agency for International Development. REACH's objectives are to assist governments and nongovernmental organizations to strengthen their capabilities to immunize children, control or eliminate immunizable diseases, and establish effective programs that will reduce child mortality due to pneumonia. Among the strategies that REACH uses for these purposes are technical assistance, training, and information dissemination.

Influencing or creating policy is not an explicit REACH objective but rather a means to an end. That end is, of course, to prevent diseases through broader and higher quality immunization coverage by EPIs (Expanded Programs on Immunization) and control of acute respiratory infections (ARI) programs. Nonetheless, in the course of implementing activities aimed at strengthening programs and institutionalizing changes, REACH has sometimes tried intentionally to encourage policy changes or changes in the political or operational landscape in which programs are carried out. This is true at the global as well as at the national and local levels.

For example, REACH has sought to raise international consciousness regarding the need not to forget the "mother's" immunization against tetanus. REACH organized and participated in global forums on tetanus elimination, conducted and analyzed studies and widely disseminated findings and reviews of maternal and neonatal tetanus in journals, and prepared the tetanus chapter in a health sector policy review published by the World Bank. REACH has also pointed out technical aspects of tetanus control needing attention (e.g., the need for more valid indicators for routinely measuring tetanus toxoid [TT] coverage) and actively participated in dialogue on them. In several individual countries (e.g., in Bolivia and Kenya), REACH suggested that EPIs officially adopt the WHO-recommended five-dose schedule of TT.

In general at the country level, REACH has advocated the adoption, dissemination, and implementation of World Health Organization (WHO) policies and standards promoting immunization and standard case management for acute respiratory infections.

By "policy," this paper refers to standard, recommended practices or strategies by the health services. As is described below, the existence of an official policy by no means assures that it is disseminated to all who need to know it or that health staff are willing and able to implement it.

There is no one path through which policies are developed and officially adopted, but many of the common steps are listed below. In various places, REACH has influenced policy development/adoption by taking each of these steps.

- Identifying the problem(s)
- Carrying out a technical analysis
- Raising awareness of an issue and/or a proposed solution

- Advocating to have the issue on the national and/or global agenda
- Participating in technical dialogue
- Securing the highest levels of support--both political and financial
- Testing proposed solution(s)

In some cases it may be difficult to determine if REACH efforts to influence policy have been effective. For example, changes may take time to wend their way through the system, other technical voices may be needed to reinforce REACH's, or political decisions may intervene at any time to either help or harm the objectives which REACH is promoting. In order to have a greater influence on policy, careful reflection is needed before, during, and after a strong technical assignment to determine how the findings can be used to promote policy improvement.

In analyzing their experiences in the field, REACH staff have distilled a series of axioms essential to policy planning and development. These axioms, derived from lessons learned in specific projects and case studies undertaken by USAID/REACH throughout the world, are not exhaustive. It is hoped, however, that they will be valuable to A.I.D. and other technical assistance projects seeking to influence policy creation and implementation.

AXIOM ONE: To influence policy, it helps to have a clearly identified problem and proposed solution.

Hepatitis B Vaccine Introduction in the Philippines

REACH provided timely and useful assistance to the smooth introduction of a new vaccine into the Philippines' EPI, helping create new standard practices in the Philippines and beyond. This effective establishment of new standard practices was greatly facilitated by the political commitment of the MOH, the clearly defined problem presented and the proposed solutions devised by REACH.

In collaboration with its subcontractor PATH, REACH worked with the Department of Health (DOH) to break new technical ground within the global EPI by confronting the issues essential to the nationwide introduction of hepatitis B vaccine into the routine EPI schedule. The REACH team concluded that with proper planning, the nationwide introduction of hepatitis B vaccination could be accomplished with a minimum of disruption to the health services. The report includes a strategic plan which carefully addresses such major issues as delivery strategies, cold chain and logistics, vaccine specifications and procurement, communication and training.

As a follow-up, REACH/PATH assisted the DOH in the review of price quotations submitted by potential vaccine suppliers for procuring hepatitis B vaccine. During his visit in November 1990, Dr. James Maynard, Executive Director of the International Task Force on Hepatitis B Immunization, oriented Philippine pediatricians on the new hepatitis B infant immunization program and issues related to integrating it into the existing EPI.

Major results of the technical assistance provided through REACH included: (1) a new specification for the pediatric dosage of hepatitis B vaccine for widespread use in public health programs, namely, 10-dose vials whose packaged volume is consistent with that of other EPI vaccines and which occupy an acceptable amount of space in the cold chain; and (2) the lowest unit price per dose of hepatitis B vaccine that has been achieved to date. The Government of the Philippines now purchases hepatitis B vaccine annually and includes it in the EPI nationwide.

Through the wide dissemination of its technical report entitled "The Integration of Hepatitis B Immunization into the EPI in the Philippines" and presentation of the Philippines work in Cameroon at a 1991 international conference on hepatitis B attended by representatives from more than 50 countries, REACH has to some extent made the Philippines recommendations standard practice in many countries throughout the world.

Financial Sustainability in the Philippines

A policy dialogue concerning the financial sustainability of both the ARI and EPI programs in the Philippines gives another illustration of this axiom. Since 1991 the Philippines Control of Acute Respiratory Infections (CARI) Program has undertaken an ambitious effort to train thousands of health personnel in ARI standard case management (SCM), with the goal of national coverage within three years. In 1992, REACH participated in an assessment of training effec-

tiveness. The study revealed that despite a significantly higher capability of trained health workers (76%) versus untrained personnel (51%) to correctly diagnose pneumonia, the antibiotic necessary to treat the disease, cotrimoxazole, was available in only 52% of the health facilities, and quantities available for home treatment were extremely limited. Even if the disease were diagnosed correctly, life-saving treatment often did not follow. A problem critical to both the effectiveness and the credibility of the entire ARI control effort had been identified.

The severe shortage of ARI drugs revealed by the health facility survey is exacerbated by the decentralization process that the Philippine government is currently undergoing. As many of the central government's functions are taken over by Local Government Units (LGUs), it is clear that some functions are falling by the wayside, including the purchase and distribution of adequate amounts of cotrimoxazole to all health facilities. REACH developed a spreadsheet model to estimate the cost of ARI medicines at the national level from 1993 to 2010. The analysis found that the total nationwide cost of drugs to treat ARI in 1993 represents less than 2 percent of the DOH budget for medicines and supplies. Given this relatively small fraction of the budget and the magnitude of the ARI problem, REACH recommended that the DOH continue to purchase ARI medicines at the national level, at least until ARI case management is well established in the field. Though the costs will rise as detection and treatment increase, they should fall as early detection and treatment with the relatively less expensive cotrimoxazole increase.

The Philippines EPI will continue to be supported primarily by the national government, with the DOH and donor organizations paying for vaccines, IEC, training, logistics and cold chain maintenance, as well as costs associated with National Immunization Days. The LGUs are already required to have health personnel working full-time, so the EPI will impose no greater personnel burden; furthermore, immunizations are estimated to require only 3 to 4 percent of their time. Therefore, the only added burden to LGUs to support the EPI consists of the cost of disposable syringes and needles used for routine immunizations. The DOH will provide all needles and syringes for National Immunization Days, supplemental immunizations, outbreak response immunizations and 10 percent of needles and syringes required for routine immunizations. Though cost estimates for the needles and syringes required to be purchased by the LGUs were not insignificant, they accounted, on average, for approximately one percent of health care costs devolved to the LGUs.

To encourage policy dialogue within the DOH for sustainable EPI and ARI programs, REACH conducted presentations and briefings. The overall analysis of the devolution of health costs showed that although the added burden of new public health expenditures vary greatly among LGUs, the increased costs do not appear to be an overwhelming burden. The average proportion of total LGU revenue for all devolved DOH costs is 12 percent. Nonetheless, REACH recommended that further analysis be conducted of revenues and devolved costs at the individual municipality-level to determine which particular areas may be more heavily burdened. The DOH intends to apply the process designed by REACH to conduct strategic financial analyses of other health programs.

AXIOM TWO: Work in tandem with the World Health Organization and/or the country's ministry of health to establish a consistent message and enhance credibility.

ARI in Nepal

In 1985, WHO recommended standard case management (SCM) for diagnosis and treatment of pneumonia based on preliminary data indicating its effectiveness. As yet, no large-scale program that controlled for independent variables had been conducted to prove its validity.

From 1986 to 1989, USAID/Nepal and REACH supported a controlled intervention trial among 13,404 children under the age of five in Jumla, Nepal, to determine whether training community health care workers in the diagnosis and treatment of pneumonia in the absence of other health care services would reduce child mortality from ARI. By the third year of the program, there was a 28% decline in the risk of death from all causes, with a significant trend toward lower mortality the longer the program was in effect.

These findings supported WHO's belief that indigenous community workers could effectively detect and treat pneumonia and reduce overall child mortality -- even without a full range of primary health care activities. In the case of Jumla, the decline in child mortality occurred despite persistent high levels of malnutrition and illness and in the context of a generally deteriorating agricultural economy.

These conclusions have widespread policy implications since some four million children die each year from pneumonia, primarily in developing countries, and thousands of rural communities fall outside any coverage network for basic health services. Decision makers in various countries now use the findings from Jumla and several other ARI pilot projects to set ARI policy for SCM in their own countries.

WHO heralded the study as additional justification for SCM, and the results were published in The Lancet and have since been cited in the British Medical Journal, the Journal of the American Medical Association (JAMA), and the WHO publication on the technical bases for ARI SCM. Since the Jumla study contributed to strengthening WHO policy, REACH has been able to use WHO's authoritative backing to advocate SCM for replication in other countries in which it supports ARI control programs.

Vitamin A in Nepal

Vitamin A deficiency increases the severity of the three main health threats facing children in the developing world--diarrheal diseases, measles, and pneumonia. Even a mild lack of vitamin A can be dangerous to children.

After demonstrating a favorable impact on child survival from SCM, in 1989 the Jumla Project in Nepal initiated a related trial to test the benefits of giving a single high dose of vitamin A to all children under five in communities with high mortality and malnutrition. This study found

the risk of death from all causes dropped 26% in the communities that received vitamin A supplementation, compared to neighboring communities that had not been given supplementary vitamin A. This affordable and effective child survival intervention has been maintained in Jumla until the present.

The results of the second Jumla study, along with findings on vitamin A supplementation in Indonesia, India, and Ghana, were cited in UNICEF's State of the World's Children 1993, with the explanation that "These studies...confirm that giving children extra vitamin A can reduce child deaths by about one third in many areas of the developing world." Results of the Jumla study were also cited to justify vitamin A supplementation by a WHO meeting in Geneva that drew conclusions from all major vitamin A trials and by an international meeting on vitamin A at Bellagio, Italy in early 1992.

SoloShot

In response to the escalating risk of contracting human immunodeficiency disease (HIV) or hepatitis B from unsterile needles and syringes, several groups have developed syringes that self-destruct after one use. REACH collaborated with WHO to conduct a field trial in Pakistan on the self-destruct single-use "SoloShot" syringe. The trial concluded that the plastic disposable syringe was easier and quicker to use than conventional disposable syringes, as well as safe and effective in preventing reuse. Based largely on this field trial, WHO authorized UNICEF to supply SoloShot syringes to immunization programs in developing countries as a direct replacement for conventional disposable syringes in countries where use of unsterile disposable devices occurs or where sterilization is not practiced. UNICEF has purchased SoloShot syringes for use in their immunization programs throughout the world.

AXIOM THREE: The donation of tangible resources may facilitate openness to policy dialogue.

REACH's experience indicates that the ability of technical assistance programs to provide financial or other resources may increase host governments' receptivity to policy dialogue. Essential donations may help establish credibility, foster trust, and make potential recipients more amenable to considering policy recommendations.

EPI in Newly Independent States of the Former Soviet Union

Emergency immunization assistance in the Newly Independent States (NIS) of the former Soviet Union has provided REACH its most significant opportunity to influence immunization policies.

Although they had the worst child survival statistics in the Soviet Union, the Central Asian Republics of Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan had been able to maintain high levels of child immunization coverage. However, with the dissolution of the Soviet Union in 1991, these new countries, which had previously relied on the central government in Moscow to set policy and standards and provide vaccine and other resources, were almost totally cut off from this support.

By early 1992, the governments were faced with severe shortages of vaccines and other immunization supplies, as well as difficulties in repairing available cold chain equipment and procuring needed additional equipment. Immunization coverage rates were falling and reports of outbreaks of vaccine-preventable diseases were on the rise.

The USAID emergency immunization support effort was designed to reverse this process. Its goal was to assist the Ministry of Health (MOH) in each country in obtaining the material and technical resources necessary to ensure that all children under the age of two years would, in 1992, be fully immunized with potent vaccines against the common vaccine-preventable diseases. The emergency support effort focussed on three activities:

- Rapidly bringing in adequate supplies of all essential vaccines so that national services could operate at full capacity;
- Providing the minimum cold chain equipment and technical assistance to ensure proper storage and transport of vaccines; and
- Initiating a technical exchange process that would lead to the examination and revision of existing immunization service policies and practices.

The first two activities were designed to fill an immediate and outstanding need to enable effective immunization of children. Later, with the emergency support in place, A.I.D./REACH moved on to working with the MOHs to review current policies and practices and establish regular mechanisms for reviewing and setting immunization policy. REACH also worked to teach governments how to purchase vaccine on the international market (the tender and bid process), a task they had never confronted before. A Vaccine Procurement Reference Manual was compiled to provide information on international standards of vaccine storage, procurement, and commerce involving pharmaceuticals and biologics.

Realizing that they had been isolated from the mainstream of scientific thought on immunization and disease control, health authorities in the four Republics expressed interest in reviewing immunization policy issues. For example, the Soviet-based immunization schedule had an unusually high number of routine contacts (e.g., nine doses of oral polio vaccine versus the international standard of four). In addition, pediatricians are conservative and quick to find contraindications to immunization. Whereas the World Health Organization has labored hard over the past decade to reduce contraindications to child immunization, the official policies in the former Soviet Union on contraindications included a long list covering many pages.

At the request of the respective MOHs, A.I.D./REACH organized and participated in a series of meetings on immunization policies, which examined existing child vaccination policies, practices, and disease control strategies, and identified problems that could be ameliorated through policy formulation. REACH brought in a team of internationally renowned immunization experts from WHO, England, and the USA to participate in the sessions. This team worked with each country's leading epidemiologists, pediatricians, immunologists, and infectious disease control specialists. REACH provided some 300 pages of key documents that REACH had had translated into Russian prior to the meetings. This information presented

established international policy on immunization that influenced the NIS as they developed their own policies.

The first meeting was held in Uzbekistan December 8-10, 1992. The three-day session was designed to be as informal as possible, to stimulate the active exchange of information among the 35 influential national participants. It was followed by a two-day session held in Kyrgyzstan December 15-16, attended by 23 persons. This session set the scene for a national conference on strengthening immunization practices held on December 17 in Kyrgyzstan, which attracted more than 240 participants from all regions of the country. In June 1993, A.I.D./REACH organized similar national policy review meetings in Tajikistan and Turkmenistan.

Major outcomes of the meetings were:

- Interest in each country in establishing optimal mechanisms and processes for the periodic review and updating of policies;
- Adoption by MOHs of streamlined child immunization schedules to reduce the required number of contacts, shorten and simplify the list of contraindications, and allow the primary immunization series to be started and completed at the earliest age possible;
- The realization by the MOH of the need to prepare a comprehensive plan for a national immunization program that will facilitate the organization of services appropriate to the country's new circumstances and that will attract and coordinate donor support.

It is unlikely that these four Central Asian Republics would have welcomed A.I.D./ REACH technical assistance on policy recommendations if A.I.D. had not first donated a generous supply of tangible resources in the form of cold chain equipment and vaccines. A.I.D./REACH's efforts in EPI in the region have been successful because of a financial commitment combined with a medium- to long-term perspective, providing vaccine and cold chain equipment; training local health workers in its use, repair and maintenance; and then moving on to more permanent changes in immunization programs.

AXIOM FOUR: Working with nongovernmental groups is one avenue for influencing government policy and practice.

EPI/ARI in Haiti

Haiti has long been the poorest country in the Western Hemisphere, living in a nearly constant state of political turmoil. A military coup in September 1991 overthrew the country's first democratically-elected president in more than a half-century. To protest the military takeover, U.S. assistance was suspended after the coup but then partially re-established in April 1992. Because the U.S. Government did not recognize Haiti's national government, REACH and other A.I.D.-funded assistance was limited to working with the private sector, which in fact provided a major portion of health care in the country.

REACH conducted an assessment of Haiti's EPI in May and June of 1992. Shortages of vaccines and other supplies (syringes, needles, diluent) were preventing the implementation of up to one-third of the EPI activities planned by nongovernmental organizations (NGOs). This was exacerbating the already critical status of national vaccination coverage. Because of the U.S. prohibition on collaborating with the current government, REACH teamed up with NGOs to ensure the continued availability of EPI supplies in the field.

In addition to designing and procuring new cold room equipment (financed by the Pan American Health Organization) to replace obsolete facilities, REACH developed a system to supply vaccines to eight major NGOs--one in each region of the MOH--which serve as "regional stores" to supply 53 NGOs throughout the country. The strategy is being implemented by the Association des Oeuvres Privées de Santé (AOPS), the major umbrella organization for Haitian private voluntary organizations.

Similarly, in ARI control, REACH is supporting a pilot NGO project that has as one objective the translation into Creole and adaption to local conditions of standard WHO materials on ARI SCM. It is hoped that these will be used by PVOs and eventually the government program throughout Haiti.

EPI in Nigeria

In Nigeria, standard immunization surveys of the 15 local government areas (LGAs) that constitute Lagos State yielded surprising information that contradicted long-held beliefs about immunization in urban areas. The study found high initial coverage for DPT1, but a subsequent high drop-out rate before completion of the basic immunization series. The drop-out between DPT3 and measles was especially high. Another finding was that in the most populous LGAs, 20% or more of all DPT1 and measles immunizations are provided by the private sector. In 8 of the 15 LGAs, between 25% and 45% of all immunizations were given by private practitioners. Similar results were found for tetanus toxoid vaccinations. Yet, because these private practitioners do not work for the government, they receive no standard training.

Government health officials for the most part express distrust of private health practitioners. REACH is encouraging LGAs for the first time to acknowledge the role of private practitioners and to incorporate them into EPI. The project is providing cold boxes for some private practitioners to help assure that they have potent vaccine. In some LGAs, private practitioners are receiving joint training with their government counterparts on correct cold chain practices, contraindications, and the national immunization reporting system. One LGA has given a separate training for private practitioners. This participation will help establish the legitimacy of private practitioners in EPI for the first time and give recognition to the vital role that they play in immunization and disease control in the country. It may also lead to private practitioners' reporting immunizations and possibly even immunizable diseases on a routine basis.

ARI Control

REACH's technical support to private-sector organizations is stimulating the acceptance of the WHO-recommended standard case management (SCM) of acute respiratory infections in several

countries. In Haiti, REACH has assisted in training field staff, establishing supervision and other support systems, as well as translating SCM training and educational materials into Creole, and adapting materials to the local culture. It is hoped that these tools will be adapted by the national ARI program.

In support of strengthening ARI control in Bolivia, REACH has worked primarily with nongovernmental organizations, but has also encouraged MOH participation. MOH staff served as trainers and local MOH counterparts participated in a training of trainers course primarily for PVO staff on planning and management of ARI control programs. The MOH's national ARI coordinator has played a major role in revising a PVO ARI manual for community health workers. In Santa Cruz, Bolivia, REACH organized a study of health practitioner skills in diagnosis and treatment of ARI. The study, conducted by REACH, PVO, and MOH researchers, showed rampant inappropriate treatment and illustrated the significant financial savings that SCM could bring. Results not only stimulated the medical establishment to accept SCM but also the MOH to establish an ARI training center at one of its hospitals.

AXIOM FIVE: A new policy does not necessarily mean new practices: various activities may be needed to change behaviors in the field.

EPI in Bolivia

Although vastly under-reported, neonatal tetanus is believed to be a significant cause of neonatal death in Bolivia. REACH has provided technical assistance to the national Ministry of Health (MPSSP) on five separate occasions since 1987. In early 1988, REACH recommended changing the policy limiting tetanus toxoid (TT) vaccination to women in their fifth and seventh month of pregnancy to one recommending that all women of child-bearing age, including pregnant women, be vaccinated with tetanus-diphtheria toxoid (Td). During 1988 and 1989, USAID and PAHO designed a Td card for women and collaborated with the MPSSP to assess areas of high risk for NNT and plan control strategies.

Most reported cases of neonatal tetanus (NNT) in Bolivia are from the lowland region of Santa Cruz. In September 1989, a REACH consultant found a low level of awareness among health care providers in the Santa Cruz region of the new policy directives to immunize all eligible women. He found that immunization coverage of women of childbearing age remained very low and that most providers continued to offer the vaccine only during the fifth and seventh month of pregnancy. He organized a seminar for the Pediatric Society of Santa Cruz on the problem, and recommendations were discussed with the MPSSP, PAHO, USAID, and National Pediatric Association representatives. All agreed on the importance of the problem and the need to take action.

A REACH team in Santa Cruz in March 1991 noted that the lack of clarity on dosage and delivery intervals was limiting the effectiveness of TT immunization. In questioning health workers, REACH encountered almost universal confusion regarding current national (and international) norms regarding TT schedules to protect women of child-bearing age and their children. Almost every health worker, when asked about appropriate intervals for the five-dose

schedule either had no idea or described the schedule inaccurately. Uncertainty persisted concerning immunizing pregnant women only in the fifth or seventh months (old policies that officially ended several years ago) and about the danger in substituting Td for TT. Even the official in charge of the local training program for auxiliary nurses expressed concern about the adverse consequences of inadvertent administration of more than two doses of TT or accidental immunization of women who were unaware they were pregnant. It is likely that this confusion is resulting in many missed opportunities to appropriately vaccinate with TT.

Contributing to this confusion was incorrect, imprecise and conflicting information coming from the national level in the form of manuals, posters and even the national women's immunization card. The REACH team found different EPI manuals available in various health facilities; all contained outdated norms and some suggested the need for only two doses of TT.

To combat this misinformation, the REACH team designed two posters, with pertinent information for health providers on TT immunization, that could be posted in all public and private health facilities, community centers, and other locations.

Compounding confusion among health personnel, REACH discovered that religious objections were behind many cases of incomplete or non-vaccination. The chief medical advisor to the Catholic Church in Bolivia had been publicly denouncing TT as a covert plot to promote family planning. REACH contacted this person directly and also tried to influence him by seeking PAHO's involvement.

EPI in Kenya

Assessment studies by the Measles Initiative (MI) in western Kenya revealed DPT1 coverage between 90% and 96%, but drop-out rates from DPT1 to measles were substantial, ranging from 29% to 33%. As in other surveys and studies in Kenya over the past few years, in the MI districts of Kisumu and Siaya, health workers' and mothers' reluctance to have sick children immunized was identified as a major obstacle to higher immunization coverage. In fact, an official policy has existed for many years which recommends withholding immunization from children only if a child has a very high fever or needs to be hospitalized, but this policy has not been made explicit or disseminated to many staff.

Since few mothers and health workers advocated immunizing even slightly sick children, many opportunities were lost, contributing both to high drop-out rates and, no doubt, to some preventable deaths. Mothers failed to keep immunization appointments because their children were ill. If and when they did return to a health facility to continue immunizations, health workers often chastised them for not having come as scheduled.

An official policy regarding immunization of sick children has just been approved and signed by the Kenyan Director of Medical Services. The concept for the written policy originated with the MI, which also developed the original text that was subsequently modified during a series of meetings with top medical and nursing staff in the MOH. The new policy has already been disseminated to district public health nurses at a nationwide meeting in August 1993. In the MI

districts, the key messages of the policy circular are being reinforced by a range of other communications materials -- "technical updates" for health workers and information kits for potential mobilizers in the communities. These kits will include information on monitoring drop-out rates at health facilities, policies on immunizing sick children, immunization schedules, and treating mothers with respect. It is hoped that these efforts will bring practice more in line with policy.

AXIOM SIX: Better use of existing data can influence policy.

EPI and the Coverage Survey Analysis System (COSAS)

As a way of influencing how EPI managers analyze their performance, REACH has made and disseminated improvements on a coverage survey analysis software initially developed by EPICENTRE and WHO. The Coverage Survey Analysis System (COSAS) enables program planners and managers to obtain much useful but previously untapped information collected in standard immunization coverage surveys. The software facilitates improved targeting of populations and understanding of missed opportunities by analyzing a variety of variables that would be difficult or unwieldy to analyze by hand. Without COSAS, coverage surveys usually generate data on: coverage for each vaccine antigen; drop-out rates; percentage of children fully vaccinated; and percentage of children vaccinated by different health care providers. With the software, it is possible also to determine indicators of quality: vaccination age profiles; time interval between doses; vaccination date profiles; missed opportunities; and percentage of children correctly vaccinated. Such information is an excellent basis on which to make strategic changes in immunization programs. An added benefit of COSAS is that it can result in greater uniformity in presentation of data, thereby facilitating comparison of surveys conducted in different places at different times.

In Burkina Faso, COSAS coverage data revealed that though access to immunization was relatively good, children were not being immunized until 15-23 months of age, several months later than is recommended by WHO. This information was used to develop a strategy for delivering measles vaccination at an earlier age.

REACH has used the COSAS program indicators in Bangladesh, Kenya, Nigeria, and other countries. REACH contributed substantially to the COSAS manual for global use. In June 1991 REACH held an international course on Management and Evaluation of Immunization Programs through the Use of Coverage Surveys and Computerized Analysis.

AXIOM SEVEN: Timely technical inputs can facilitate policy creation or change.

EPI/Global Measles Policy

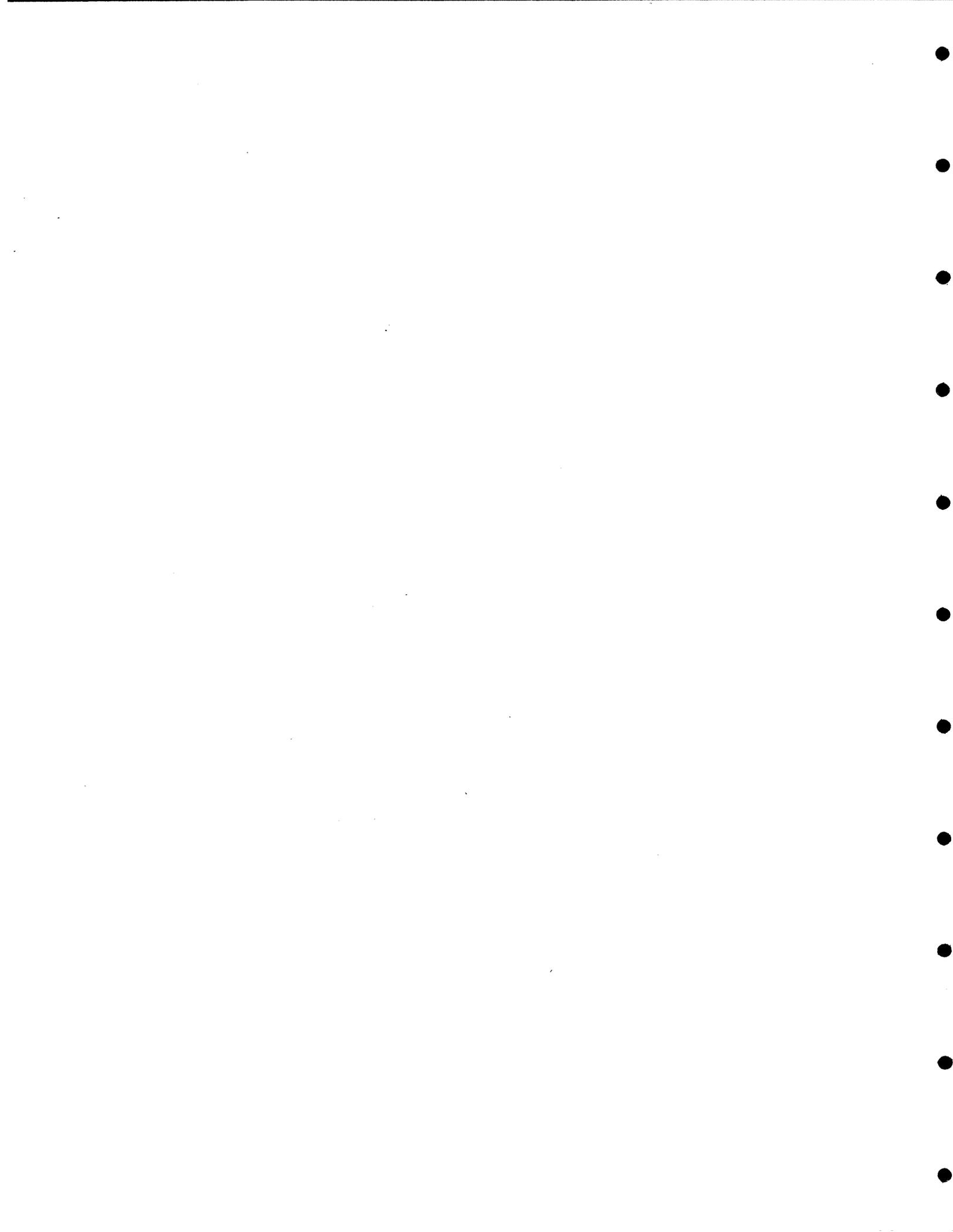
The standard age for measles vaccination in developing countries is nine months, but in many countries measles is "hyperendemic," with as many as one in three infants contracting the disease before reaching nine months of age. The Edmonston-Zagreb (EZ) high-titer vaccine was developed from a nonstandard strain of measles. Several studies indicated better seroconversion

with this vaccine at six months of age than at nine months with the standard titer vaccine of the Schwarz virus strain commonly in use. Introduction of the high titer EZ vaccine in Kinshasa, Zaire, led to an all-time low in measles cases and a shift in age distribution of cases to older children.

As a result, in 1989, WHO adopted a global policy recommending the use of the high titer vaccine at six months of age in areas, particularly in Africa, of high-risk of infant deaths due to measles. Follow-up studies, however, indicated that in some countries children immunized with the high titer vaccine had a higher mortality rate due to other common childhood diseases than those who received the standard titer measles vaccine. These results were not consistent from country to country, producing confusion as to whether methodological problems incorrectly accounted for this increased child mortality.

At a global consultation in Geneva in February 1991 to discuss and analyze the situation, WHO/EPI called for a review of mortality data from sites in which the vaccine had earlier been studied. REACH supported its subcontractor Johns Hopkins University in conducting an extensive study of the high titer EZ vaccine in Haiti, which determined that the high titer vaccine did significantly increase child mortality, especially among girl children of lower socioeconomic status who were malnourished.

These conclusions, which corroborated earlier findings from Senegal, were presented to policy makers and researchers at a meeting on the high titer vaccine in Atlanta, Georgia, in June of 1992. WHO decided that the evidence was conclusive enough to change its policy on recommending the use of the high titer measles vaccine. WHO removed the vaccine from its approved list of EPI vaccines and simultaneously issued warnings to all countries that the use of the vaccine has been associated with excess mortality, especially in female children.



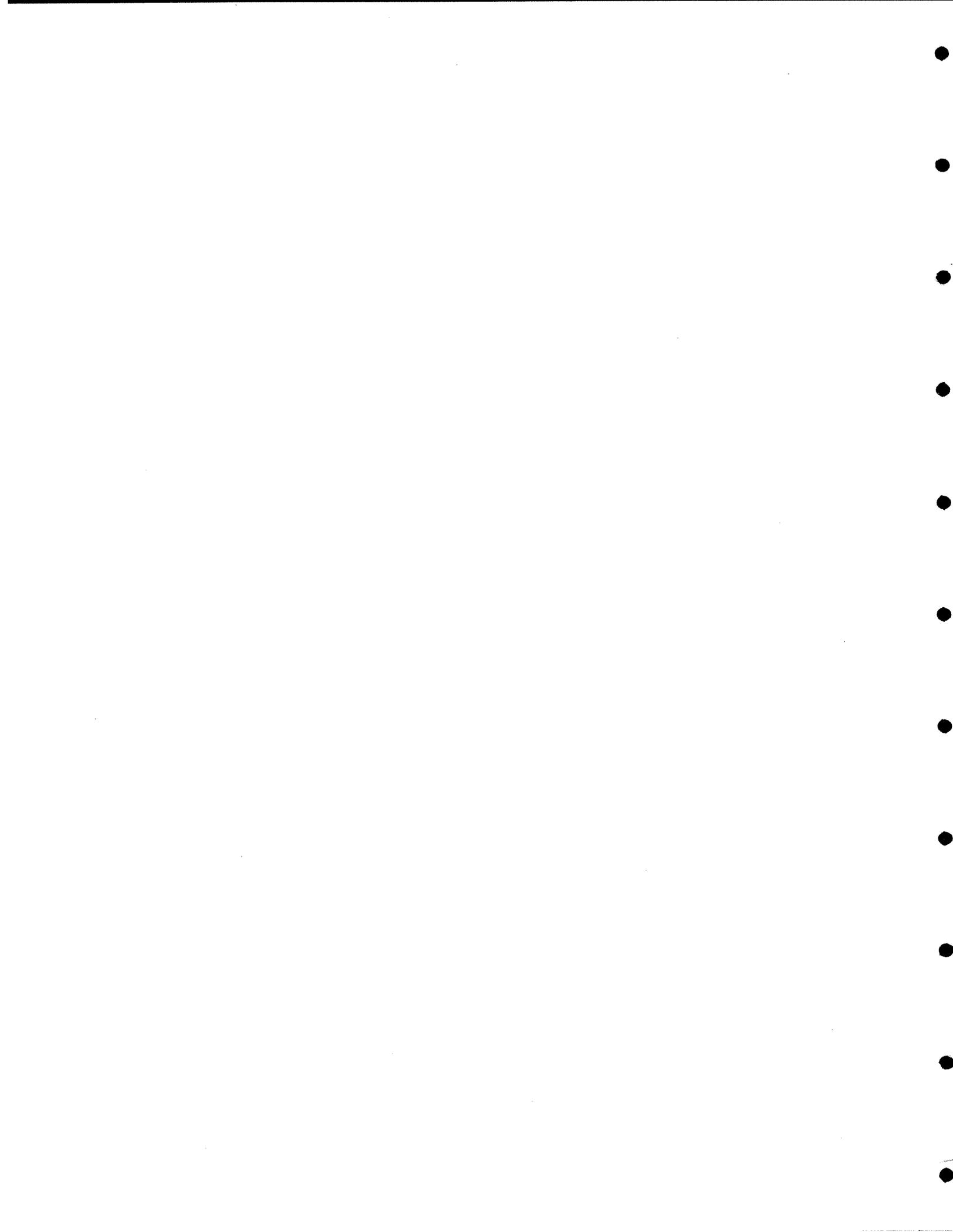
-2-

**REFLECTIONS ON
REACH IMMUNIZATION
PROGRAM ASSISTANCE
TO THE
FORMER SOVIET UNION,
1992-1993**

Robert Steinglass
Technical Director

The Resources for Child Health (REACH) Project
John Snow, Inc. (JSI)
1616 N. Fort Myer Drive, Suite 1100
Arlington, VA 22209

A.I.D. Contract No.: DPE-5982-Z-00-9034-00



I. INTRODUCTION

Over the past 18 months, a potential tragedy for children in the former Soviet Union (FSU) has been averted--although the emergency is not yet over. In public health and other fields, the collapse of the Soviet Union has brought a breakdown in the systems of centralized control, manufacture, distribution and financing of goods and services. Medical supplies in general, and vaccines for children in particular, have been early victims of a widespread failure in the supply and logistics systems.

This paper was written to review the immunization needs of the FSU and the A.I.D./REACH response. Because it is intended to be reflective, frank, and provocative, it may challenge conventional thinking on emergency assistance.

II. BACKGROUND

The Resources for Child Health (REACH) Project is funded by the Office of Health of the U.S. Agency for International Development (A.I.D.) and managed by John Snow, Inc. In March 1992, the U.S. Government (USG) requested that a REACH/Centers for Disease Control team assess the needs of immunization services in the Central Asian Republics of the FSU and advise A.I.D. on where and how that Agency -- specifically, its Office of Foreign Disaster Assistance (OFDA), Office of Health, and NIS Task Force -- should target its assistance. REACH alerted A.I.D. to the fact that a public health disaster could occur: that immunization coverage rates were falling due to vaccine shortages from traditional suppliers in Russia, and that children were threatened with outbreaks of vaccine-preventable infectious diseases which had long been controlled.

As a result of the REACH assessment visits, A.I.D. decided to launch an emergency immunization support program to avert disability and death from vaccine-preventable diseases in the newly independent countries of Kyrgyzstan, Turkmenistan, Tajikistan and Uzbekistan. The demographic and epidemiological profile of the 35 million people residing in these poorest of newly independent countries resembles that prevailing in much of the developing world -- with high fertility, high infant mortality, and a heavy burden of communicable disease.

A.I.D. assistance included the supply of vaccines to permit the primary immunization of more than one million children. While averting death and permanent disability of thousands of children, these vaccines also prevented the collapse of these countries' health services, which were on the verge of atrophy for want of commodities.

However, the A.I.D. response went considerably further. In addition to the procurement and shipment of vaccines, the assessments resulted in a USG donation of nearly one million dollars of cold chain equipment to ensure the safe storage and transport of heat-sensitive vaccines. While not originally acknowledged by some of the other donors, the need for such cold chain equipment was critical for protecting the donated vaccine and ensuring its effectiveness in protecting children. All vaccine, equipment and commodities were procured from UNICEF by OFDA with U.S. funds and delivered aboard USG Department of Defense aircraft.

A technical-exchange process was rapidly initiated not only to respond to the immediate emergency but also to strengthen and modernize the immunization service and to reduce future dependence on external support. While some variations, depending on need and opportunity, occurred among countries, a balanced package of technical assistance was provided, encompassing program planning, policy reform, vaccine procurement, training, cold chain repair and maintenance, and translation and adaptation of printed materials. A framework for the A.I.D./REACH emergency and technical assistance package is shown in Figure 1.

Figure 1

<u>Framework for REACH Emergency Immunization Program</u>		
<u>★1st Phase★</u> <i>March-June 1992</i>	<u>★2nd Phase★</u> <i>July-December 1992</i>	<u>★3rd Phase★</u> <i>Began January 1993</i>
Assess vaccine and cold chain needs	Training in cold chain management and vaccine logistics	Establish cold chain repair and maintenance system
Donate vaccine, cold chain and commodities	Train in vaccine forecasting and procurement	Assist in international vaccine tender and bid
Review problems amenable to policy reformulation	Conduct workshop on policies and practices and identify policy-making mechanism	Assist in preparing comprehensive vaccination plans

The provision of vaccine, cold chain equipment, and technical assistance provided a reprieve, so recipient countries could begin to develop a coordinated (and comprehensive) approach to policy, practice, supply and equipment issues. It also "bought some time" for the USG and other donors to organize medium- and longer-term assistance.

A chronology of milestones in A.I.D./REACH support to the assisted countries appears in Figure 2.

Figure 2

**A.I.D./REACH Emergency Immunization Activities
in the Central Asian Republics**

CHRONOLOGY

January 1992	Secretary of State James Baker announces U.S. commitment to help immunize more than 50,000 children in the republics of the former Soviet Union as part of an emergency medical program to alleviate critical shortages of essential medicines and medical supplies.
March 1992	A.I.D./REACH and Centers for Disease Control assess the immunization needs in four Central Asian Republics.
April 1992	A.I.D./REACH sends three logistics/cold chain experts to four Central Asian Republics to plan for the receipt and distribution of anticipated U.S.-donated vaccines and commodities.
May 1992	U.S. Department of Defense aircraft deliver emergency stocks of vaccine and cold chain equipment.
September 1992	A.I.D./REACH sends two experts for three months to assist with the planning for the receipt and distribution of a second shipment of vaccines and cold-chain equipment and to train local officials in the use of donated materials.
October 1992	U.S. aircraft deliver a second shipment of vaccine, supplies, and equipment to all republics. May and October shipments enable immunization of 1,000,000 children.
November 1992	A.I.D./REACH sends expert to train officials in the international vaccine-procurement process, including tender and bid.
December 1992	A.I.D./REACH organizes workshops in Kyrgyzstan and Uzbekistan on international immunization policies and practices and on identifying a potential process for setting their own policies in the future.
March 1993	A.I.D./REACH sends two experts to design and apply standardized protocol for rapid assessment of current and future vaccine needs in four Central Asian Republics, as well as in Moldova and Georgia. A.I.D./REACH staff serves as technical advisor to U.S. delegation at Meeting on Vaccine Supply in the NIS, organized by WHO/EURO.
May 1993	A.I.D./REACH sends two experts to Moldova and Georgia to assess needs for cold chain equipment and update need for vaccines.
June 1993	A.I.D./REACH organizes workshops in Tajikistan and Turkmenistan on international immunization policies and practices and on identifying a potential process for setting their own policies in the future.
July 1993	The U.S. Government and the Government of Japan sign an agreement for immunization support to Georgia, Moldova, Kyrgyzstan, and Turkmenistan; REACH will coordinate and provide technical assistance through March 1994.

III. CONCEPTUAL APPROACH

The conceptual underpinnings for REACH work in the former Soviet Union owes much to the lessons learned repeatedly by other groups involved in the field of disaster epidemiology. Some of the principles in this field apply well to the current public health crisis facing the immunization services in the FSU.

Disasters can be anticipated, prepared for, and even averted.

During the past twenty years, disaster epidemiology has evolved to improve both preparedness for and response to disasters. The approach has been to design appropriate technical responses which, while perhaps dependent on the good will of volunteers, are not so amateurish as in the past. Lessons from past disasters should not have to be relearned each time a new disaster erupts.

In the absence of vaccine, levels of immunization coverage fall and outbreaks of disease naturally occur. While this is obvious to infectious disease epidemiologists, other persons may see a hurricane approaching and argue against evacuating the population in its path in the hope that it will not touch shore. Explosive epidemics of measles and other communicable diseases can be expected unless those in control take early action. In the absence of measles vaccination, all children will get measles, and in developed countries at least 3 of each 1000 will die from it. In the FSU, statistics such as this translate into 15,000 unnecessary deaths for each annual cohort of unimmunized newborns. Before the A.I.D. assessment, an outbreak of diphtheria occurred, the magnitude of which the world has not witnessed since before the Second World War.

The aim of donated vaccines should be to restore the status quo ante.

Times of crisis and system breakdown may not be appropriate for introducing new vaccines. The overriding need is to return to basics by protecting the youngest children against measles, poliomyelitis, diphtheria, whooping cough (pertussis), tetanus and tuberculosis with the standard core of familiar vaccines: respectively, measles, oral polio vaccine, DPT and BCG. Until recently, the Soviet Union was able to achieve higher levels of early immunization coverage than most countries of the world, including the United States. With the proper tools (sufficient vaccine and related supplies and equipment), its constituent countries can regain high coverage levels through the existing delivery systems. Integrating unfamiliar vaccines into the immunization schedule would be distracting and require considerable training and re-orientation. Important vaccines such as hepatitis B, Hemophilus influenzae type B (Hib), and MMR (measles-mumps-rubella) can be introduced once the dust settles--and once funding for a continuous affordable supply can be secured.

Donations should respond to objectively identified needs and not be pushed by donor interests.

Officials in the FSU know what they need: familiar vaccines and effective cold chain equipment to preserve them. In times of vaccine shortages, price rises, serious banking difficulties, frozen foreign reserves, and uncertainties about future supplies, Ministries of Health (MOHs) might be tempted by any offer. However, inappropriate international responses, including sales of higher-priced products from the donor country, are not appropriate in emergency situations, undermine attempts to

safeguard the public good, and ultimately lead to resentment on the part of the recipient MOHs.

An example of an inappropriate donor-driven agenda would be a one-time donation of costly MMR (measles-mumps-rubella) vaccine, rather than a much larger supply of monovalent measles vaccine for the same amount of money. Not only is rubella (German measles) vaccine largely unknown in the FSU and a rubella-control strategy non-existent, but use of such a multivalent viral vaccine preparation is actually contraindicated by Soviet policy and practice, where monovalent preparations of measles and mumps vaccines are not administered with less than a two months' interval. While policy reform is needed to allow simultaneous administration of live viral vaccines, MMR vaccine would be challenged by pediatricians, cause confusion, and risk going unused while taking up valuable space in refrigerators. Local officials have been articulate in requesting what they need during the current emergency. Good listeners will provide technically relevant items whose need is already well-accepted.

Local officials should participate in the determination of needs in the field to ensure that the quantity and type of commodities are both technically appropriate and desired by and acceptable to the recipients. To do otherwise is to risk alienating or, worse, offending the recipients. REACH was told point-blank by officials in Osh Oblast, Kyrgyzstan to be sure that whatever the U.S. Government decided to donate would be worth the oblast's effort to mobilize scarce vehicles and fuel to collect from the capital city hundreds of miles away!

Immediate needs should be met without undermining local capacity to cope.

As a matter of principle, vaccines should be purchased locally whenever possible, instead of being donated. Over the long haul, vaccine manufacturers in the FSU need critical inputs of financial and technical assistance to increase production, improve quality, and regain vaccine self-sufficiency. These vaccines have been effective in the past in controlling vaccine-preventable diseases in the FSU. For the time being, locally produced vaccines can still be purchased in rubles for a fraction of the cost of vaccines from any other source. Nevertheless, MOH budgets cannot accommodate price increases of up to fifty-fold for some vaccines. In most cases, mechanisms have not yet been put in place domestically to ensure the continued arrival of vaccines from domestic or international sources. Donations of emergency vaccines are needed to provide a safety net until such time as vaccines can be procured locally in adequate quantities and with assured quality.

Identify and target the most vulnerable population.

The health authorities within any administrative unit must be provided with enough vaccine, syringes, and other immunization supplies to meet the needs of all infants resident within their jurisdiction. To cope with vaccine shortages, MOH officials have already begun appropriately to target the epidemiologically most important age group -- infants and young children -- for primary vaccinations. Vaccine must be available in sufficient quantity to permit all infants to be vaccinated throughout the entire administrative area.

Appropriate technical assistance can strengthen the capacity of the system to respond.

If improved but unfamiliar building materials are provided for earthquake reconstruction, some

guidance in their use is required. Similarly, the cold chain system in the FSU is built on shaky ground with chronic weaknesses. The tools and, in some cases, the knowledge needed to mend it are absent. Experts in vaccine logistics and cold chain are needed for effective utilization of both domestic and donated vaccines and optimal use of existing resources. This type of technical assistance aids longer-term recovery of the immunization-delivery system, while at the same time satisfying donors that their investment in emergency vaccines is protected.

IV. TECHNICAL LESSONS

REACH learned that it is possible to craft a rapid, timely and targeted technical response, based on field-assessed needs, which both meets the emergency humanitarian requirements as well as enhances the long-term capabilities of health services to deliver immunization. Technical assistance was planned so that donated commodities were appropriate to current needs and so that the ability of the system to cope in the future was strengthened. *The involvement of a centrally funded health project at the outset when determining the appropriate response to an emerging disaster represents a model worthy of replication.*

The Marriage of Technical and Emergency Expertise

Either the number of disasters is truly increasing or advances in telecommunications have made emergencies more accessible to viewers in donor countries and, therefore, harder to ignore. In response, the U.S. Office of Foreign Disaster is accustomed to moving large quantities of commodities extremely effectively and rapidly. However, OFDA does not appear to have the staff, mandate or time to attend to the technical nuances and longer-term implications of the commodities supplied. By way of illustration, the "bible" for procurement of tested and approved cold chain equipment, the Product Information Sheets issued by UNICEF and WHO for immunization-related equipment, was unfamiliar to the experienced officers at OFDA.

The REACH approach to the emerging disaster in the FSU included a level of technical assistance unprecedented in A.I.D.'s standard emergency humanitarian response. A.I.D. found it advantageous to involve the Office of Health and its REACH project to ensure that the programmatic, technical and operational issues surrounding immunization would receive their due attention.

The combination of the speed and logistical savvy of OFDA with the technical skill of a centrally funded Office of Health project led to a rapid and relevant response. Commodities alone were not sufficient; technical assistance was also required. Involvement in emergency responses was unusual for the Office of Health and REACH. Emergency responses typically must move a good deal faster than they are accustomed to, yet they were able to facilitate both emergency assistance and longer-term system strengthening. They kept their vision fixed and pursued it doggedly, in the face of the many distractions that arose in such a highly visible effort.

Equipment and commodities were selected so that something useful would be left behind (e.g., cold chain equipment and steam sterilizers) and on-the-ground technical assistance was required to make appropriate use of donated items.

With an Eye on the Future

REACH learned that even in emergency situations it is possible to advance development and promote long-term sustainability. This was done through (1) the extensive training that accompanied the delivery of new cold chain equipment and supplies; (2) a review of the immunization policies and practices and an identification of regular mechanisms to set and review immunization policies; and (3) assistance with learning the unfamiliar procedures of the tender and bid process to purchase vaccines on the international market. In addition, no campaign-style immunization was advocated, despite some pressure to do something highly visible. The routine health delivery systems were still in place and adequate to reach the population.

REACH was able to assist the MOHs to plan for the use of the donated commodities. Cold chain training materials were developed, and training was provided to bring some practices (e.g., vaccine handling) up to international standards. The donated cold chain will last long after the emergency is over and help to ensure that children are protected with potent vaccines. The cold chain will result in less vaccine wastage, which will translate into less dependence on external donations. Spare parts for the cold chain and repair tools were also provided, as well as training in cold chain repair and maintenance.

REACH learned that timely provision of commodities increased its credibility greatly and permitted the project to expand its technical role into matters of policy. Workshops on immunization policies, practices and policy-setting resulted in the countries streamlining their immunization schedules such that immunization could begin and end earlier in life with fewer contacts and fewer doses of vaccine. This will reduce inefficiencies and lead to reduced requirements for vaccine. The workshops stimulated the newly independent countries, passive recipients in the past of policies dictated from distant Russia, to take responsibility for identifying their own problems and formulating their own policies.

Anticipatory Planning

Despite an overall vision of where REACH hoped to be heading, funding uncertainties necessitated incremental steps. REACH could not be sure whether funds for more flights would be forthcoming or how much A.I.D. money there was likely to be for commodities. Therefore, lists of needed supplies and equipment for procurement were always prioritized and frequently updated in case no additional funding was forthcoming.

Uncertainties in early 1992 as to whether or not there would be a second round of flights in October 1992 had some undesirable technical consequences. For example, REACH needed to supply the full complement of bulky disposable syringes/needles in April 1992 to take advantage of available free transport, even though more than half the vaccine was not scheduled to arrive until four months later.

In the beginning before careful cold chain assessments were completed, the full range of needs could not be known. Providing A.I.D. with immediate documentation of need proved to be a dilemma for REACH, which constantly had to balance the need of A.I.D. to respond rapidly and visibly with the need to respond in a technically responsible manner.

On the one hand, REACH was concerned that it might frighten donors with long lists of cold-chain requirements. On the other hand, because REACH's early lists of minimum cold chain needs were procured by the USG before comprehensive assessments could be undertaken, there was a danger that non-technical people would perceive that the cold chain had been "taken care of" and that donors could move on to other needs.

Although A.I.D. urgently demanded procurement lists and associated costs with assurances that these calculations could be revised later, in reality REACH was often held to hastily prepared lists. Therefore, REACH became more skilled at anticipating what documentation might be requested in order to be ready to comply.

V. ORGANIZATIONAL LESSONS

Well-seasoned technical experts, who were known to REACH to be highly competent and possess sound judgment, were selected for the field work. They were backstopped with abundant technical and administrative support from Washington. The highest compliment to REACH field staff was paid by the Deputy Minister of Health in Kyrgyzstan who told a senior visiting A.I.D. official from Washington that "you think that Carl Hasselblad [REACH in-country technical officer] works for you. In fact, he works for us!"

A network of competent local fixers was needed on the ground.

It cost very little to engage and retain these local persons, but in the absence of full-time REACH staff they played a critical role as conduits between REACH, the MOHs and the U.S. embassies. Their presence also allowed REACH to play a helper role to advance other development efforts (e.g., the REACH network was instrumental in generating a cabled request from the U.S. embassy in Kyrgyzstan for technical assistance from the Centers for Disease Control for epidemiological surveillance).

Because of communications difficulties between Washington and the field and the need for logistical flexibility in the field, it was essential to delegate some decision-making authority to field staff, supporting them with strong backstopping from Washington.

Given rudimentary channels of communications, difficulties in finding working faxes and photocopying machines, canceled flights, unavailable aviation fuel, and the inconvenient time difference between Washington and the FSU countries, maintaining regular communication both between the countries and to/from the U.S. required an unusual degree of perseverance and dedication.

The difficulties can be exemplified by an anecdote. Beyond the technical challenge of preparing for a series of policy workshops, simply finding paper, photocopy equipment and necessary supplies required creative planning well in advance. A REACH Technical Officer stationed in Tajikistan stockpiled scarce paper to assure its availability for documents being translated by REACH into Russian for the workshops in Uzbekistan and Kyrgyzstan. After his evacuation with all other Americans due to the eruption of civil war, document preparation continued in Tajikistan. However,

when the local REACH interpreter arrived at the border of Uzbekistan with 200 kilos of documents, he was not permitted to cross, requiring the REACH Technical Officer to travel many hours from Tashkent (Uzbekistan) to the border to retrieve the documents.

Insistence on adhering to strict organizational protocol would have inhibited the rapid response.

Flexibility and innovation were required. Rather than rely solely on senior management to convey messages laterally between donors and then through channels to technical levels, REACH established direct links with technical counterparts in other donor agencies to improve coordination, share findings and reduce the possibility of redundancies. Ironically, the bureaucracy in Washington has become more involved with the project, making it increasingly more difficult to achieve speedy results as compared to the early days when embassies had only just been established.

Operating according to standard procedures established by A.I.D. in Washington, REACH nevertheless had to take risks to be effective.

While waiting for eventual approvals, REACH frequently had consultants standing by ready to travel - knowing that once the bottlenecks had been removed, funders in Washington would be impatient. On one occasion, REACH had one consultant holed up in Copenhagen and one in Vienna for several days while awaiting marching orders. Business was not "as usual." Planning needed to be done with far less certainty than normal.

VI. DISSEMINATION

Because the FSU effort had high political visibility in Washington, many persons needed to know what was happening. REACH pursued dissemination aggressively to inform A.I.D. decision-makers of the latest field findings, establish credibility that the project was on task, share the findings, shape the agenda, and get others to adopt REACH conclusions and recommendations (for example, that donor resources should be directed at strengthening the cold chain). REACH reports were shared widely and rapidly. A publications list covering some twenty consultancies conducted from March 1992 to July 1993 appears in Annex 1.

Highly visible emergencies require highly visible public relations.

A REACH video documented the arrival of the emergency commodities and was worth its weight in gold in generating political support within Washington. These images were evidence of the practical accomplishments and spoke louder than all the words, although the footage risked creating the impression that the problem of shortages had been solved. Similarly, props were used to make important points, such as an uninsulated wooden box typical of those in which all vaccine in the FSU was transported without ice.

Messages were kept simple, reduced almost to the level of "sound bites." This required knowing when to say what to whom. Thus, "to protect children, first the vaccine itself needed to be protected." "To protect the investment in donated vaccine, cold chain equipment was needed." It

was effective to express the expected impact of the donated vaccine to a simple estimate of the number of child deaths which would be averted, without tedious caveats and explanations of the many assumptions needed for valid interpretation.

Keeping informed about the political climate was important. Reading the newspapers and news magazines and sharing the findings with A.I.D. officials became a fetish. Also staying current with professional journals and other donors' reports on developments in the FSU was important. In one case, REACH responded in a letter to The Lancet to correct a published erroneous impression by another assessment team on the purported good condition of the cold chain in the FSU.

Active dissemination also advanced the long-term goal of development. When REACH translated over 300 pages of key English immunization documents into Russian for use in a series of immunization policy workshops, it took the next step and sent the set to other development and donor agencies and MOHs for their use, as well. Similarly, REACH disseminated the policy recommendations of the international team from the workshop in Uzbekistan in both Russian and English to other countries and agencies to stimulate policy reform elsewhere.

VII. POLITICAL LESSONS

It was necessary to be responsive to distracting requests (e.g., assisting the MOH in Kyrgyzstan to develop a list of emergency medical needs in the wake of an earthquake), as this generated support and appreciation in Washington and Kyrgyzstan for REACH's primary mission.

REACH needed to anticipate political needs in Washington.

For example, REACH predicted that it would have to be ready at some point with a cost comparison of vaccine procured by the USG through UNICEF (for one twentieth the cost) versus direct from American manufacturers. Similarly, REACH was ready with a conceptual piece by REACH consultant Gordon Larsen describing the methodology for forecasting 1993 vaccine needs in an attempt to develop a standardized protocol. The resulting protocol for rapidly assessing the vaccine needs specified the various assumptions and method of treating, for example, the backlog of unimmunized children from the previous year, vaccine reserve factors, wastage factors for each vaccine, actual stock balances, proportion of stock available for primary vaccine series, actual proportion of previous year's vaccine needs met by Russian manufacturers, donor consignments of vaccine, etc. Applying such a standardized instrument and using the actual field experience of the MOHs, rather than relying on theoretical desk-generated assumptions, increased REACH credibility among the recipient countries and other donors who were also trying to determine vaccine needs.

Dedicated staff in many A.I.D. and Department of State offices and U.S. embassies worked in tandem with REACH. REACH encouraged them to feel ownership and share the credit for a successful intervention. The embassies were so pleased by the concrete and practical support and by expressions of MOH gratitude that they were keen to officially cable Washington with the latest findings of REACH staff and consultants, thus ensuring that Washington would need to articulate a response or a position. In such a way, the embassies ensured that the continuing needs would attract attention in Washington.

To be effective, it was necessary to appreciate the various interests and agenda (hidden and overt) of all the players, especially of potential funding sources.

A single, short-lived, centrally funded project of one bilateral donor cannot do it all alone: the needs are too great. In expectation of possible short-lived political commitment and for the sake of continuity to meet the wider technical and developmental needs in addition to the need for commodities, REACH consciously sought from the start to draw in other donors who have a longer planning horizon. To that end, REACH put aside institutional vanity and considered that its field staff and findings belonged to the wider donor community. Consequently, WHO/EURO, WHO/Geneva, CDC and UNICEF have all participated in REACH-organized activities.

There are risks involved in such a highly visible effort. The disadvantage of operating inside of a fishbowl is that there is a good deal of second-guessing. The limelight shows all the warts. When something does go wrong--such as the non-arrival of icepacks along with the provided cold boxes during the first shipment in April 1992, and the serious mis-direction of cold chain equipment dispatched from the U.S. military base in Germany--it is very visible and public.

Finally, the MOHs require and expect decisiveness on the part of donors. There is a serious risk that repeated donor assessments of needs without provision of commodities will be perceived by the MOHs as a substitute for action.

VIII. A NOTE OF CAUTION

A.I.D.'s and REACH's involvement in the FSU carries an opportunity cost. Any agency contemplating a role in the FSU should recognize this up front. The immunization program has been an extremely intense, time-consuming endeavor. The demands on staff and consultant time have been great. For example, the pool of talented cold chain consultants is not large; if they are put to work in the FSU, they simply are unavailable for important assignments in Kenya, Nigeria, the Philippines, etc.

IX. NEXT STEPS

In 1992, the emergency immunization support program assisted Kyrgyzstan, Turkmenistan, Tajikistan, and Uzbekistan to maintain immunization services and began the process of change. In 1993, further REACH assistance will be provided by A.I.D. in these countries to consolidate and expand upon the gains made in 1992 and also in Moldova and Georgia. A summary of the need and rationale for technical assistance appears in Annex 2. In summary, this support is intended to:

- ensure that the countries have sufficient quantities of the standard vaccines used in the Expanded Program on Immunization (EPI) in 1993 and beyond for primary immunization of all their children;
- develop a "vaccine safety net," which provides timely warning to the international community of impending shortages;

- assist in the development of a cold chain between vaccine producers in the FSU and the countries;
- further strengthen cold chain practices, repair and maintenance within each country and provision of additional commodity support; and
- provide technical assistance to address such issues as international vaccine procurement, immunization policy formulation, program planning, and program monitoring.

Inspired by the discussions at the Meeting on Vaccine Supply in the Newly Independent States (NIS), convened in Copenhagen by WHO/EURO on 18-20 March 1993, Japan and the USA have agreed to marry their comparative advantages, build upon their prior assistance to the NIS, and consolidate and expand upon the gains already achieved by providing further commodity support and technical assistance to selected countries until early 1994. The joint response of Japan and the USA, together with the dynamic involvement of the MOHs in the selected countries, will form the nucleus of a model multi-year, multi-party plan for wider donor collaboration in the selected countries.

The needs are large. The coordinated assistance of all donors will be needed to assure that the total needs are met. Other donors will be encouraged to assist in meeting other important needs, e.g., to improve disease surveillance and to develop social mobilization approaches.

ANNEX 1

Bibliography of REACH Documents

A. ASSESSMENT

- A1. Bassett, David. 1992. Emergency Childhood Immunization Support Program: Tajikistan, 16 - 19 March 1992. Arlington, VA: John Snow, REACH.
- A2. Bassett, David. 1992. Emergency Childhood Immunization Support Program: Turkmenistan, 20 - 25 March 1992. Arlington, VA: John Snow, REACH.
- A3. Steinglass, Robert. 1992. Emergency Childhood Immunization Support Program: Kyrgyzstan, 15 - 20 March 1992. Arlington, VA: John Snow, REACH.
- A4. Steinglass, Robert. 1992. Emergency Childhood Immunization Support Program: Uzbekistan, 23 - 26 March 1992. Arlington, VA: John Snow, REACH.
- A5. Steinglass, Robert. 1992. Emergency Immunization Support Initiative: Central Asian Republics of the NIS, 7 March - 5 April 1992 [Summary Report]. Arlington, VA: John Snow, REACH.

B. FIRST PHASE (APRIL - JUNE 1992) ASSISTANCE

- B1. Bass, Allan. 1992. Emergency Childhood Immunization Support Program: Tajikistan, 19 May 1992. Arlington, VA: John Snow, REACH.
- B2. Larsen, Gordon. 1992. Emergency Childhood Immunization Support Program: Turkmenistan, 22 April - 20 May 1992. Arlington, VA: John Snow, REACH.
- B3. Hasselblad, Carl. 1992. Emergency Childhood Immunization Support Program: Kyrgyzstan, 26 April - 5 June 1992. Arlington, VA: John Snow, REACH.
- B4. Bass, Allan. 1992. Emergency Childhood Immunization Support Program: Uzbekistan, 19 May 1992. Arlington, VA: John Snow, REACH.

C. ASSESSMENT AND FIRST PHASE OVERVIEW

- C1. Hasselblad, Carl. 1992. Emergency Childhood Immunization Support Program: Tajikistan, Turkmenistan, Kyrgyzstan and Uzbekistan [Summary Report], March - June 1992. Arlington, VA: John Snow, REACH.

D. SECOND PHASE (SEPTEMBER - DECEMBER 1992) ASSISTANCE

D1. Unavailable.

D2. Larsen, Gordon. 1993. Emergency Immunization Support Program -- Technical Assistance in Needs Assessment and Cold Chain Planning: Turkmenistan, 26 October - 4 December 1992. Arlington, VA: John Snow, REACH.

D3. Hasselblad, Carl. 1993. Emergency Immunization Support Program -- Technical Assistance in Cold Chain and Program Planning: Kyrgyzstan, 3 October - 19 November 1992. Arlington, VA: John Snow, REACH.

D4. Pott, John. 1993. Emergency Immunization Support Program -- Technical Assistance in Cold Chain Assessment and Planning: Uzbekistan, 4 September - 18 December 1992. Arlington, VA: John Snow, REACH.

D5. Woodle, Dian. 1993. Trip Report on EPI Vaccine Acquisition in Uzbekistan, Kyrgyzstan and Turkmenistan: 25 October - 30 November 1992. Arlington, VA: John Snow, REACH.

D6. Woodle, Dian. 1993. Summary Report on EPI Vaccine Acquisition in Uzbekistan, Kyrgyzstan and Turkmenistan: 25 October - 30 November 1992. Arlington, VA: John Snow, REACH.

D7. Steinglass, Robert. 1993. Meetings on Immunization Policies, Practices and Policy-Setting in the Republics of Uzbekistan and Kyrgyzstan: December 1992. Arlington, VA: John Snow, REACH.

D8. Hasselblad, Carl. 1993. Field Coordination of Second Phase Emergency Immunization Support Program Activities in Four Central Asian Republics: 2 September - 28 November 1992. Arlington, VA: John Snow, REACH.

E. 1992 OVERVIEW

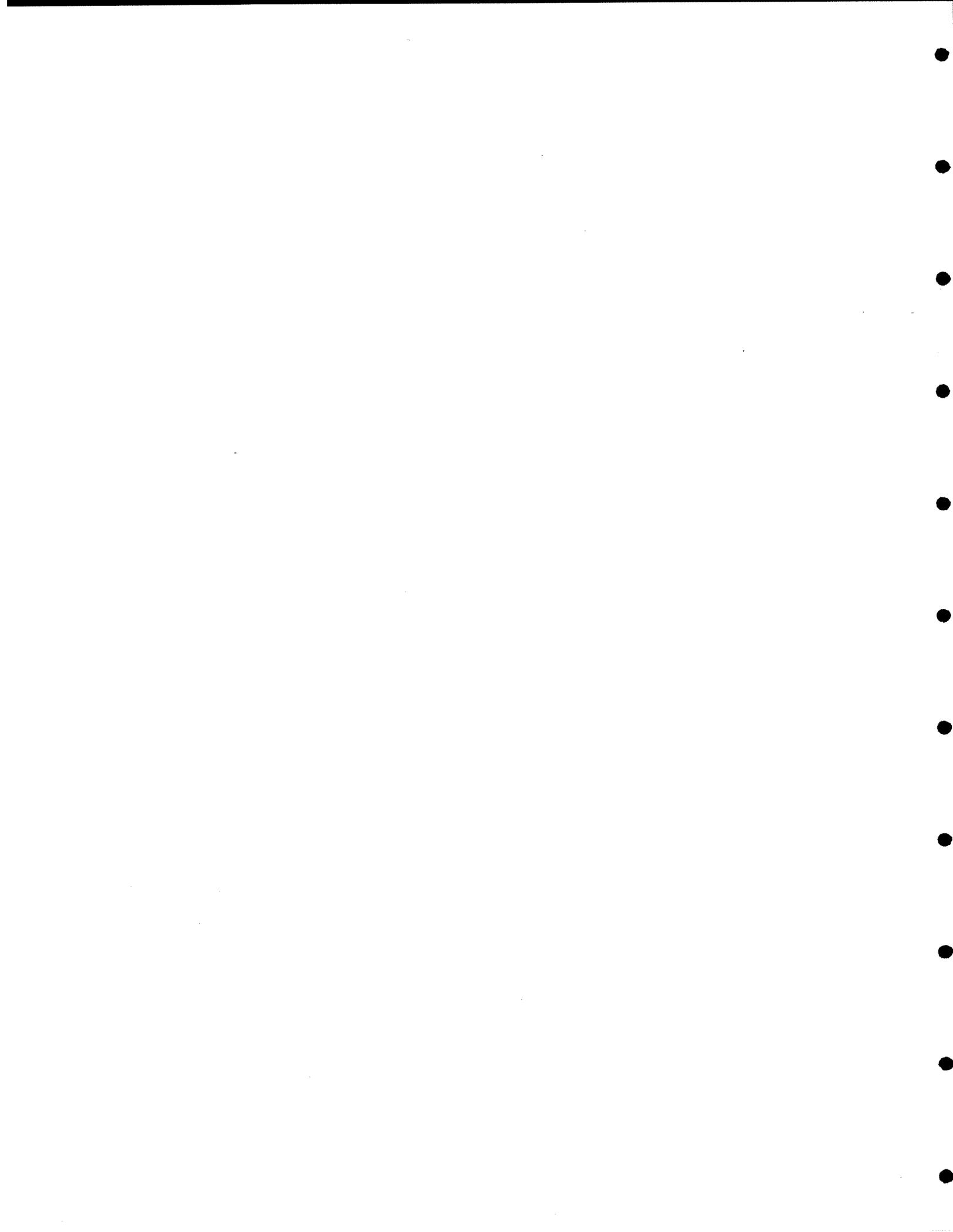
E1. Steinglass, Robert and Hasselblad, Carl. 1993. Review of USAID/REACH Emergency Childhood Immunization Support Activities in 1992 in Four Central Asian Republics and Anticipated Requirements for 1993 [Summary Report]. Arlington, VA: John Snow, REACH.

F. 1993 ASSESSMENT

- F1. Larsen, Gordon. 1993. USAID Emergency Immunization Support Program, Newly Independent States of the Former Soviet Union: Protocol for Standardized Evaluations of Vaccine and Cold Chain Supply, 1 March 1993. Arlington, VA: John Snow, REACH.
- F2. Larsen, Gordon and Spanner, Soren. 1993. Emergency Immunization Support Program -- Assessments of 1993 Vaccine Needs in Six Newly Independent States: Turkmenistan, Uzbekistan, Kyrgyzstan, Tajikistan, Moldova and Georgia, 22 February - 20 March 1993. Arlington, VA: John Snow, REACH.

G. 1993 ASSISTANCE

- G1. Steinglass, Robert. 1993. Report of a Technical Visit To: UNICEF and WHO, Copenhagen, Tajikistan, Turkmenistan, Kazakhstan, Uzbekistan, Georgia, and Moldova, 10 June - 22 July 1993. Arlington, VA: John Snow, REACH.
- G2. Steinglass, Robert. 1993. Seminars on Child Immunization Policies, Practices and Policy-Setting in Turkmenistan and Tajikistan, June - July 1993. Arlington, VA: John Snow, REACH.
- G3. Larsen, Gordon. 1993. USA-Japan Joint Immunization Initiative: An Update of Program Needs in 5 Newly Independent States: Turkmenistan, Kyrgyzstan, Tajikistan, Kazakhstan and Georgia, 3 May - 20 July 1993. Arlington, VA: John Snow, REACH.
- G4. Spanner, Soren. 1993. Emergency Immunization Support Program: Moldova, 21 May - 19 June 1993. Arlington, VA: John Snow, REACH.



ANNEX 2

The Need and Rationale for Continued Technical Assistance

1. VACCINE AND VACCINE SAFETY NET

Many of the countries of the former Soviet Union will require donation of vaccine in 1993 and beyond. If they are to complete primary immunization of their children, these countries need a vaccine safety net. The countries which have received REACH assistance are suffering from similar breakdowns in systems of manufacture, supply and finance of vaccine. Therefore, certain shared problems should be dealt with on a region-wide basis. It may be useful for donors to capitalize an emergency reserve of vaccines, syringes and essential cold chain equipment (for higher cold chain levels), which can be accessed in case of the failure of manufacturers to honor their supply contracts.

Underpinning a regional vaccine safety net is the need for an effective information system which (1) continually audits the ability of domestic manufacturers to meet the requirements and the contracted amounts and (2) monitors and forecasts vaccine requirements based on current inventory and lead time to receive supplies. The information system would also need to track donated supplies in the pipeline.

2. COLD CHAIN

Region-wide

The initial link in the cold chain -- from manufacturer to first administrative level-- continues to be the weakest yet the easiest to rectify. Transport of vaccine in uninsulated containers without ice from the vaccine manufacturers in the FSU to the republican and oblast levels undermines any efforts taken within the individual countries to improve their cold chain. The need for technical assistance is becoming apparent to the vaccine manufacturers in the FSU as a necessary step to retain consumer confidence. Activities which are needed to address cold chain problems at the higher levels include:

- Investment of a modest sum to produce one-way transport boxes with polystyrene sheets fitted inside. Prototypes have been developed by firms in Moscow but finance is required.
- Assistance to vaccine manufacturers in implementing the use of insulated transport boxes.
- Assistance to vaccine producers and the Tarasevich Institute regarding adoption of the international vaccine shipping guidelines, use of cold chain monitors, advance notification of vaccine shipment, and improved packing standards.

National

REACH cold chain assessments in six countries have recently been completed as a basis for national planning, for rational cold chain procurement and as part of developing a cold chain repair and maintenance system.

In 1992, donations of cold chain equipment from the USA launched the process of establishing an international-standard cold chain in four countries. However, additional commodity and technical assistance is required to secure the system at the national level and to extend the cold chain to appropriate service points in the same four countries, as well as in other countries of the FSU.

Cold chain maintenance and repair systems are presently not fully operational in any of the countries. There is an urgent need to strengthen repair capabilities through training and provision of tools and spare parts.

A cold chain consists of more than just equipment. Proper procedures and trained staff are essential elements. USAID/REACH has assisted the MOH in Kyrgyzstan to design and test a cold chain manual in Russian aimed at the level of the health facilities. Technical assistance is required to refine the manual, introduce it into the other REACH-assisted countries, and extend it down to the health-facility level. In addition, appropriate cold chain training materials (based on WHO documents) for supervisory staff need to be drafted, tested and introduced.

3. VACCINE PROCUREMENT

Technical assistance is needed to continue the work begun in Kyrgyzstan, Uzbekistan and Turkmenistan -- that is, to walk a core group of procurement staff through an actual international vaccine tender and bid process (as well as through the contractual and financing aspects). The development of alternative supply sources and of MOH staff trained in procurement will increase the competition and put pressure on Russian vaccine manufacturers to improve their vaccine quality and cold chain practices. Hard currency should be donated to Kyrgyzstan, which is further ahead in the process of exploring new procurement approaches, in order to finance an international tender and bid exercise.

4. POLICY FORMULATION

Immunization policy formulation meetings in Kyrgyzstan, Uzbekistan, Turkmenistan and Tajikistan have been completed. Health authorities realize that they have been isolated from the mainstream of scientific thought on immunization and disease control and are genuinely eager to learn from international experience. They also lack experience in policy formulation. Technical assistance will be provided to Georgia and Moldova to conduct meetings and seminars with the countries' leading pediatricians and epidemiologists to review existing domestic immunization policies, practices, disease-control strategies, and policy-setting options; and to expose MOH staff to the latest epidemiological and immunological thinking.

5. MANAGEMENT

Technical assistance is needed by the MOHs to create a national immunization plan which includes the following components: objectives, coverage and disease-reduction targets, guidelines (on immunization schedule, contraindications, etc.), strategies (e.g., use of polyclinics, defaulter tracing, outreach, special strategies for polio eradication, cold chain system, etc.), responsibilities of different sectors and disciplines, time frames for achieving targets and completing activities, evaluation schemes, and resource and vaccine requirements. This plan will facilitate organization of services in the changing circumstances of these independent countries and will also help attract and coordinate support from donors.

Kyrgyzstan has requested early assistance in completing its immunization plan, and the other REACH-assisted countries will soon be in a position to require this same assistance.

6. RESEARCH

A parallel study comparing the potency of frozen and unfrozen vials of measles vaccine would be useful, as there is considerable resistance to the WHO standards which stress that, at higher levels of the cold chain, measles vaccine should be stored in freezers when use is not imminent.

Another parallel study on the effect of multiple freezing and thawing cycles on the potency of polio vaccine would be useful, as there is again reluctance among some staff to freeze polio vials. These studies could be commissioned with the national control authority in Russia or with an independent laboratory.

7. HEALTH EDUCATION

The countries have achieved high immunization coverage and the population is aware of the importance of immunization. However, the changing economic and political circumstances may make it more difficult to sustain public interest and confidence in immunization. In order to sustain achievements, technical assistance is needed to help the MOHs formulate plans for individual and mass health education directed at health-care providers and to the public, which would include an explanation of any changes in the immunization schedule. Teaching on immunization could be incorporated into school curricula, if not already included.

8. TRAINING

The MOHs will need to invest in basic training in immunization as part of the core curriculum in medical and nursing schools. Additionally, in-service training for staff of polyclinics and other sites should be provided for current staff. Technical assistance would be helpful to introduce and adapt some of the training courses which are expected to become available in Russian during 1993, including the standard WHO Mid-level Managers course.

Kyrgyzstan has led the pack in identifying some of the aspects of an immunization program which require changing. Two-way exchanges of staff between countries could be supported as a means of influencing immunization practice and policies.

Appropriate English journals dealing with public health and epidemiology could be donated to these countries. Existing documents in Russian should be printed and distributed more widely.

An annual immunization conference for regional groupings of countries, such as the Central Asian Republics, could be conducted. Regional newsletters concentrating on immunization, epidemiological surveillance, and disease control could be considered.

9. MONITORING

The MOHs have a well-defined registration system for recording a child's immunizations, tracking drop-outs, and determining vaccine requirements. The system is also used to monitor coverage. The MOH is unfamiliar with monitoring systems used in most other countries. The appropriateness of introducing simpler methods of monitoring and validating immunization coverage, including both routine and survey methods and use of the Computerized EPI Information System (CEIS), should be considered.

10. SURVEILLANCE

Disease surveillance--the collection, analysis, use and feedback of epidemiological data-- is critical to continually guide immunization efforts. The MOH already collects impressive quantities of data and needs to develop the other elements of an effective surveillance system, especially feedback to all levels of the health system and to all sectors of the health services, including pediatricians. Surveillance for adverse reactions would be useful to continually monitor the safety of vaccines and to substantiate the guidelines on contraindications.

-3-

**EPI/ARI STRATEGIC
FINANCIAL PLANNING:
LESSONS LEARNED
FROM THE PHILIPPINES**

J. Brad Schwartz, Ph.D.
Senior Economist
Research Triangle Institute

May 1993

Resources for Child Health Project
1616 North Fort Myer Drive, 11th Floor
Arlington, VA 22209 USA

USAID Contract No.: DPE-5982-Z-9034-00



ACRONYMS

AFP	Acute Flaccid Paralysis
ARI	Acute Respiratory Infections
BCG	Bacillus Calmette Guerin
CARI	Control of Acute Respiratory Infection (Program)
CDD	Control of Diarrheal Disease
CIDA	Canadian International Development Association
CSP	Child Survival Program
DOH	Department of Health
DPT	Diphtheria, Pertussis, Tetanus
EPI	Expanded Program on Immunization
GOP	Government of the Philippines
IEC	Information, Education, and Communication
LGAMS	Local Government Assessment and Monitoring Service
MCH	Maternal and Child Health
MCHS	Maternal and Child Health Service
NID	National Immunization Day
OPHN	Office of Population, Health, and Nutrition
OPV	Oral Polio Vaccine
ORI	Outbreak Response Immunization
REACH	Resources for Child Health Project
RTI	Research Triangle Institute
SI	Supplementary Immunization
UCI	Universal Child Immunization
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VII	Vaccine Independence Initiative
WHO	World Health Organization

ACKNOWLEDGEMENTS

The Philippines EPI/ARI Strategic Financial Planning exercise was conducted in close cooperation with the Department of Health, Government of the Philippines. Senior officials at the DOH, including Secretary Juan Flavio Velasco and Chief-of-Staff Jaime Galvez-Tan, are especially thanked for their active support of the financial planning process. The author is particularly indebted to DOH personnel from MCHS and LGAMS, including Dr. Maribel Costales, Dr. Francis Cruz, and Dr. Juan Perez, for information, advice and guidance. Dr. Emmanuel Voulgaropoulos, Patricia Moser, as well as Marichi De Sagun, and Dr. Dodong Capul of the Office of Population, Health and Nutrition, USAID/Manila, are thanked for their valuable input throughout the process. Other individuals from associated DOH offices, programs and projects, including Melahi Pons, Mario Taguiwalo, Tom DeAgnes, Steve Solter, and Charles Stover, are thanked for their comments and suggestions. Last, but not least, Nils Daulaire, Rebecca Fields, Richard Moore, Robert Steinglass, and Bob Weierbach of the REACH Project are thanked for their extensive technical assistance and support.

EXECUTIVE SUMMARY

Sound financial planning based on reasonable estimates of costs and revenues is important for the sustainability of health programs such as the Expanded Program on Immunization (EPI) and the Acute Respiratory Infections (ARI) program in any country. In developing countries, problems with changing donor commitments, new program strategies, rising vaccine and medicine prices, decentralization of health services, and scarce government resources underscore the importance of careful financial planning to safeguard resources needed for reaching EPI and ARI goals.

Simple calculation and forecasting of required program costs, however, are not sufficient to ensure the sustainability of EPI and ARI. In order to be an effective policy tool, financial analyses must be made an integral part of a process that involves key stakeholders in a way that prompts policy dialogue, builds consensus, and results in concrete financial policy and implementation decisions.

In the Philippines, REACH successfully developed and tested an innovative approach to strategic financial planning for EPI and ARI. This activity resulted in new financial commitments from the Department of Health (DOH), increasing the sustainability of these programs. Valuable lessons were learned for successfully implementing similar studies in other settings.

The process developed and tested for this strategic financial planning exercise consisted of:

- key informant interviews;
- definition of program strategies;
- collection and analysis of baseline data on program costs and funding;
- definition of key financing issues;
- estimation of current and future program costs, funding, and funding shortfalls;
- definition and assessment of financing alternatives; and
- conduct of policy dialogue and consensus-building presentations/workshops.

The Philippines' experience suggests several general conditions under which this type of technical assistance is most effective. Factors that are likely to make the process successful include:

- the presence of a pre-existing financing issue or problem,
- the level of government commitment to the financial planning process,
- the policy-making environment,
- the level of government commitment to the program,

- the level of donor (sponsor) commitment to the process,
- the availability of appropriate counterparts,
- the demand for program services,
- the maturity and success of the program,
- the size of the program, and
- the qualifications of the task leader for the financial planning process.

I. INTRODUCTION

Sound financial planning based on reasonable estimates of costs and revenues is important for the sustainability of health programs such as the Expanded Program on Immunization (EPI) and the Acute Respiratory Infections (ARI) program in any country. In developing countries, problems with changing donor commitments, new program strategies, increasing vaccine and medicine prices, decentralization of health services, and scarce government resources underscore the importance of careful financial planning to safeguard resources needed for reaching EPI and ARI goals.

Simple calculation and forecasting of required program costs, however, are not sufficient to ensure the sustainability of EPI and ARI. In order to be an effective policy tool, financial analyses must be made an integral part of a process that involves key stakeholders in a way that prompts policy dialogue, builds consensus, and results in concrete financial policy and implementation decisions.

In the Philippines, REACH successfully developed and tested an innovative approach to strategic financial planning for EPI and ARI. This activity resulted in new financial commitments from the Department of Health (DOH), increasing the sustainability of these programs. Since the beginning of the Philippines EPI/ARI strategic financial planning exercise, the DOH has increased its share of program funding for Fiscal Year 1993 to include all of the projected funding shortfall for EPI vaccine (nearly \$3 million) and the national requirement for ARI medicines (about \$0.6 million).

The purpose of this report is to document the lessons learned from the Philippines EPI/ARI strategic financial planning exercise and to generalize the applicability of the approach to other developing countries. The next section briefly summarizes the background of the Philippines exercise. The third section describes the process, including a discussion of what worked, the limitations of the approach, and pitfalls to be avoided in future applications. The fourth section identifies and discusses key conditions for the success of the financial planning process. These optimal conditions serve as guidelines for the suitability of the approach in other settings. The last section notes the results of the financial planning process in the Philippines and recommends next steps.¹

II. BACKGROUND

The Philippines EPI has made great gains in recent years, achieving in 1989 the Universal Child Immunization target of 80 percent fully immunized children. In addition to routine program activities, the DOH is now embarking on a series of new strategies aimed at eradicating wild polio virus, increasing hepatitis B immunization coverage, and eliminating neonatal tetanus. At the same time, donor commitments to funding vaccines for the program are projected to decline rapidly in the next few years. The short- and long-run financial implications of these developments needed to be carefully examined and alternative financing sources investigated.

¹The details of the Philippines EPI and ARI financial analysis--including program descriptions, assumptions used in calculations, spreadsheets of financial baseline and projection data, graphs, and presentation graphics--are separately documented in three REACH trip reports.

The Philippines Control of Acute Respiratory Infection (CARI) program, established in 1987, was expected to achieve national coverage for ARI standard case management by the end of 1993. Even though case management training was proceeding as planned, the program was experiencing implementation problems because of a lack of ARI medicines in the field. To make sure that ARI medicines were available for treating pneumonia, the costs and financial responsibility for the procurement of these medicines needed to be determined and appropriately programmed into budgets.

In addition to these EPI and ARI financial concerns, the implementation of the Philippines Local Government Code, which gives fiscal responsibility to local authorities for many health services previously administered by the central and regional DOH authority, increased the need for financial planning for EPI and ARI services and supplies to sustain the gains made in EPI and to successfully complete the establishment of ARI services.

USAID/REACH was requested by the DOH to assist in this strategic financial planning exercise designed to form a basis for discussions regarding future EPI and CARI resource requirements and commitments. An important aspect that differentiates this exercise from past REACH costing studies is the process of the exercise itself. The financial planning process, in addition to simply calculating current costs and forecasting future resource requirements, was designed to promote policy dialogue both within the DOH and between donors and the DOH on critical EPI and ARI financing issues and alternatives. These discussions were intended to help build consensus within the DOH on a financing strategy and ultimately to lead to definitive financial policy decisions and action.

The financial planning exercise was carried out in three one-month missions that occurred between September 1992 and February 1993. The first step of the process (September 20-October 17, 1992) consisted of key informant interviews, collection of program information and baseline data, preliminary financial calculations, and initial introductions and policy discussions with DOH management and donor agency representatives.

The second mission (November 23-December 16, 1992) consisted of additional data collection:

- an updating of DOH and donor commitments;
- the development of a Lotus-based EPI financial spreadsheet model;
- forecasts of annual vaccine costs, commitments, and funding shortfalls for the period 1993-2010; and
- the definition and recommendation of EPI financing alternatives.

To encourage policy dialogue and build consensus, these findings were presented in a series of workshops with the DOH, donor agencies, and related projects and programs.

The purpose of the third and last step of the process (February 1-26, 1993) was to develop Lotus-based spreadsheets to estimate and forecast the national costs of ARI medicines, to determine EPI supplies required at the local government level, and to calculate the relative cost burden of EPI on the local governments. The results of these calculations, along with EPI and ARI financing

recommendations, were presented in a workshop series attended by staff from the DOH, USAID and related programs and projects.

III. THE PROCESS

The process developed and tested for this strategic financial planning exercise was designed to determine baseline and future program resource requirements, to stimulate policy discussions, and, ultimately, to encourage concrete financial policy decisions and action.

In a sense, the financial models, spreadsheets, and analyses of current and future resource requirements can be viewed simply as important inputs and by-products of the planning process itself. A conscious decision was made prior to the technical assistance that the primary outcome of the exercise was not to be a technical report of program cost projections and financial analyses but rather an analysis of the **consensus-building process** for rational policy decisions. Previous experience indicated that key decision-makers largely ignored technical reports that presented financial requirements if this information was not presented in the context of a planning process.

The thinking was that the exercise would be deemed a success if the DOH and donor agencies with vested interests in the programs were informed of the future financial requirements and engaged in a policy dialogue that led toward a consensus concerning financing mechanisms. Actual decisions taken for the financial sustainability of the programs as a result of the process were desired but would not be considered the litmus test of whether the process was worthwhile or successful. Because host countries are sovereign, any donor-assisted financial planning process is limited to simply encouraging policy dialogue aimed at reaching consensus of opinion and decisions. The old adage of being able to lead a horse to water but not being able to force it to drink applies to this financial planning process.

It is also important to note that the financial planning exercise took the Philippines EPI and ARI program strategies as given. That is, it was not the intention of this technical assistance to examine whether the current strategies for immunization or treatment of acute respiratory infection are optimal to attain the Philippines' program goals, but rather to examine the financial implications of the strategies in place at the time. These strategies, therefore, were treated as input to the financial planning process.

The financial planning process consisted of:

- key informant interviews;
- definition of program strategies;
- collection and analysis of baseline program cost and funding source data;
- definition of key financing issues;
- estimation and projection of future program costs, funding, and funding shortfall;

- definition and assessment of financing alternatives; and
- conducting policy dialogue and consensus-building presentations/workshops.

Key Informant Interviews

The first step of the financial planning process was to interview virtually everyone who had a vested interest in the Philippines EPI and ARI programs, persons concerned with the public and private financing of health care services, and persons concerned with child survival. In the Philippines, these included interviews with more than 50 management and staff personnel from the DOH EPI and ARI program offices, the Maternal and Child Health Service, the Child Survival Program, the Health Finance Development Service, the Finance Bureau, the Procurement and Logistics Service, the Biological Production Service, the Local Government Assessment and Monitoring Service, the Field Epidemiology Training Program, Regional Health Offices, USAID/OPHN, REACH, WHO, Rotary International, the Canadian International Development Association, UNICEF, and the University of the Philippines.²

The primary purpose of these interviews was to gather information on the key issues and concerns about the EPI and ARI programs from the perspective of each stakeholder, including DOH program staff and management, related project and program personnel, and donor representatives. The key informant interviews were found to be particularly useful for obtaining individual perceptions of the "lay of the land" for the essential financing issues involved and of each individual's stake in the program. The interviews also allowed discussion of the severity of the EPI and ARI funding problems and identification of possible alternative financing solutions.

These short courtesy calls were also used to give background information on the purpose and scope of the exercise, how the work was contracted, who was involved in the work, and the counterparts to be identified, as well as to obtain permission to contact and interview other DOH personnel. In the case of higher-level DOH management, the interviews served to set the stage for follow-up presentations and workshops to be conducted later.

A secondary purpose of the interviews, especially for DOH program staff and donor representatives, was to collect cost and funding data. Collecting data from several sources for the same data element helps to either confirm or raise questions on the reliability of the data. For example, in a few instances, donors gave different levels of future funding commitments from those reported by the DOH, and different offices within the DOH reported conflicting cost and funding information. The subsequent resolution of each of these inconsistencies afforded an opportunity to have all parties in agreement on baseline cost and funding data.

In general, it was found that one-on-one interviews were needed so that the individuals being interviewed would not feel inhibited in their responses and would give honest opinions about EPI and

²A complete list of the individuals interviewed is contained in Schwartz, J. Brad, "Philippines EPI/ARI Strategic Financial Planning: Trip Report, September 20-October 17, 1992." Arlington, VA: REACH.

ARI financing issues.

Definition of Program Strategies

The Philippines EPI and CARI program strategies were defined in terms of current and future objectives, services delivered, and support activities. This information was obtained through key informant interviews with DOH program managers and staff and from individuals in related activities that support the programs. Program documentation, including operational plans and objectives and documents that detail the accomplishments to date, also was reviewed. The definition of the program strategies included a precise definition of the population to be served by the program, the current coverage rates for that population, and future coverage and disease-reduction goals.

The importance of the program strategy lies in the fact that key parameters for baseline costing and cost projections are detailed. This process also allows for inconsistencies and other problems to be uncovered and resolved. The search and review of documents for the latest EPI and ARI program strategies revealed several contradictory statements that provoked a dialogue among program staff concerning the exact strategy that was being followed and prompted final decisions on the strategy from the program manager. For example, some decisions had not yet been made for the strategy for National Immunization Days (NIDs) that were to begin in the Spring of 1993. This realization prompted discussions of the procedures to be followed and of assumptions to be used in the costing of this EPI component. Vaccines that were to be administered on NIDs, target coverage rates, wastage factors, and target populations are examples of issues that were identified and subsequently resolved.

Final assumptions to be used in the costing portion of the financial planning exercise were developed in close consultation with program staff, then approved by the program manager before the exercise continued. These assumptions included the parameters necessary to determine the total annual dose requirements for each vaccine included in EPI. (The program strategy assumptions developed for vaccine dose requirements for the Philippines EPI are shown in Annex 1 as an example.)

Collection and Analysis of Baseline Data on Program Costs and Funding Sources

Baseline data on costs and funding sources for the current fiscal year (1993) were collected and analyzed. During the first mission, a data collection protocol was developed. Although original plans called for contracting with local consultants to collect and verify the data, the DOH volunteered to collect the information so that the program staff would become familiar with the data collection and analysis process.

Cost components of the program included those related to personal services, maintenance and other operating expenses, and capital outlay. Cost elements were classified as either recurrent or investment costs. Recurrent costs result from ongoing program activities and include salaries and benefits of health personnel, medicines and supplies, operating and maintenance costs of equipment and vehicles, and subsequent purchases of capital goods when the goods have expended their useful lives. Investment costs include training, research and evaluation, technical assistance, and information, education and communication (IEC) campaigns. Where appropriate, costs were also classified into local or foreign. The foreign-cost component, such for international purchase of

vaccines and ARI medicines, was calculated in order to determine the magnitude of foreign currency requirements in future years.

A careful analysis of cost shares, by type (recurrent and investment costs; personnel, training, equipment, etc.) was conducted for the current fiscal year to profile the program and to identify the primary program "cost driver," that is, the component that is responsible for the largest share of program costs. The sources of funding for the EPI and ARI programs in the base year were collected from the DOH program office and confirmed through interviews with DOH and the donor agencies. Lotus-based spreadsheets were then developed to document and analyze data on costs and funding sources.

The process of devolution of central DOH functions to local governments initially confounded the EPI and ARI financial planning process because some decisions had not yet been made as to which program cost components would be retained by the DOH and which would become the responsibility of local governments.³ Cold chain equipment replacement and maintenance costs, for example, initially were to be assigned to local governments, but eventually were assumed by the DOH in the Fiscal Year 1993 budget. The responsibility for these components had to be determined before baseline costing and analyses at the national and local levels could be finalized.

Definition of Key Financing Issues

Through interviewing key informants, defining program strategies, and analyzing data on program costs and funding sources, the critical financing issues for the sustainability of EPI and CARI were clarified.

Comparison of all cost components, especially the primary cost drivers and the funding sources, revealed the extent to which the DOH relied on donor assistance for each cost element of the programs. This information was particularly useful in the presentations/workshops because, by highlighting the primary cost drivers and the reliance on donor assistance, the discussion was focused on the heavy dependence on uncertain donor support for essential program elements. This general financing issue for the Philippines DOH is also likely to be a central financing issue for the sustainability of EPI and ARI programs in most other developing countries.

In the Philippines, it was determined that vaccine is, by far, the primary cost driver for EPI (78 percent of program costs in Fiscal Year 1993) at the national DOH level. It should be noted that this unusually high proportion of program costs attributable to vaccine in the Philippines is largely due to the effects of devolution. Because the costs of health personnel, along with other costs such as facility maintenance, are now the fiscal responsibility of local governments (and therefore not vulnerable to donor cutbacks), vaccines make up a larger share of the EPI budget at the national level. Prior to the Philippines' devolution, when virtually all EPI costs, including the costs of health

³In the Philippines, "devolution" refers to the implementation of the Local Government Code of 1991 (Republic Act No. 7160) and its rules and regulations for the decentralization of certain powers, authorities, responsibilities, and resources of national-level agencies (e.g., the DOH) to local governmental units (provinces, cities, and municipalities).

personnel, were borne by the national-level DOH and its donors, vaccine accounted for only about 35 percent of total program costs. In countries with a centrally funded EPI, vaccine will likely be in the 30 to 40 percent range, depending on the maturity of the program, method of service delivery, demand for immunizations, prices of vaccines relative to other inputs, extent and condition of the cold chain, training requirements, etc. In general, vaccine is likely to account for a larger share of total EPI program costs in more mature programs that have already incurred the initial start-up costs of training, IEC, and the establishment of the cold chain.

In consultation with the DOH, it was decided that the financial planning exercise for the national-level EPI would focus on financing alternatives for vaccines because (1) funding for vaccines was identified through key informant interviews as the critical financing issue for the sustainability of EPI, (2) the cost share and funding source analyses confirmed the importance of vaccine financing, and (3) a severe funding shortfall caused by donor cutbacks was imminent.

At the local government level, the financial analyses revealed that the cost of needles and syringes are second only to the fraction of the cost of health personnel required for EPI service delivery.⁴ The costs of health personnel, however, essentially are fixed in relation to EPI at the local level, because personnel are fixed in local budgets for the next several years according to the rules and regulations of the devolution. Because local governments are required to provide the labor necessary for EPI service delivery, the provision of this labor is not a financing problem for EPI at the margin. Other cost components at the local level (the fraction of the total local public health cost of transportation, fuel, and utilities attributable to the support for EPI, for example) are smaller than the cost of needles and syringes required for EPI.

The major reason why the cost of needles and syringes is a relatively large component of the local EPI requirement in the Philippines is the almost exclusive use of high-cost disposable needles and syringes, rather than less-expensive (per dose) re-usable needles and syringes. Although it has been recommended by WHO that the DOH switch to less expensive re-usable needles and syringes, there appears to be a strong preference by the DOH to support local producers of disposable needles and syringes rather than purchasing the re-usable type on the world market. Re-usable needles and syringes and sterilizers currently are not manufactured locally. In addition, it was reported that health personnel favor the disposable needles and syringes because they do not require extra time for sterilization and because they represent "modern technology." (Unfortunately, it was also reported that disposable needles and syringes were often re-used.) In most other developing countries, the use of relatively expensive disposable needles and syringes for EPI probably would not be affordable, nor recommended.

At the margin, therefore, the key sustainability issue for EPI at the local level is the provision of needles and syringes by local governments in support of the national-level DOH EPI. In consultation with the DOH, it was decided that the question to be addressed by the financial planning process was whether local governments could be expected to provide the needles and syringes or whether this expenditure was an overwhelming burden that the DOH would have to assume in order to ensure that

⁴It has been estimated that 1 percent of physicians' time, 3 percent of nurses' time, and 4 percent of midwives' time is spent on EPI service delivery in the Philippines.

EPI coverage rates are maintained.

For ARI, the cost of training is the largest component of the Philippines CARI program at the national DOH level, mainly because the program is still relatively new and a large number of health personnel still require training. However, ARI case management training is expected to be completed in Fiscal Year 1993, with all costs fully funded by donor agencies. In addition, virtually all other CARI program costs at the national level (including management workshops and conferences, supplies and equipment, logistics, IEC, monitoring and supervision, program support, research and evaluation, and recording and reporting systems) are fully funded by donors. The fiscal responsibility for the cost of health personnel to provide CARI services (usually a large cost component of any public health program) and the cost of ARI medicines were devolved to the local governments.

DOH policy for ARI medicines has been to augment local government supplies with 10 percent of the estimated national drug requirement. Unfortunately, since the beginning of the CARI program, there have been severe shortages of "first-line" ARI antibiotics in the field. Recent DOH surveys indicate that fewer than 50 percent of health facilities had medicines available for the treatment of ARI. Because ARI medicines were in short supply and are critical for the success of the program, it was decided in consultation with the DOH that the financial planning exercise would focus on the estimation of the cost of the national supply of ARI medicines and on alternative financing strategies at the national DOH level for providing them.

Estimation of Future Program Costs, Funding, and Funding Requirements

Based on given program strategies--including the definition of the populations, target coverage rates, and cost components--future annual costs for vaccines, needles and syringes, and ARI medicines through the year 2010 were estimated in close consultation with DOH program managers and other individuals familiar with the programs. The estimated recurrent costs depends largely on population coverage and disease-reduction goals. Demographic population projections for various sub-populations (e.g., children under five years of age) and for various levels of government (e.g., provinces and cities) were needed to forecast resource requirements. In the Philippines, these population projections were obtained from the National Statistics Office.

Annual funding amounts by the government and donor agencies, the program/project, and its purpose (training, cold chain, salaries, etc.) were identified for each appropriate year of the forecast. The future annual funding requirement, defined as the "financing gap" between projected costs and funding, was obtained by subtracting funding commitments from costs for each year projected. Cost projections, funding amounts, sources, and requirements identify the magnitude of the funding shortfall for the program cost drivers. These projections were presented to DOH program managers and budget officers for their review. Their comments were used to further refine the cost and funding projections of the programs. The assumptions used to estimate and project program costs and funding were documented.

Developing Lotus-based spreadsheet models for EPI and CARI cost and funding-source data facilitated changes in key assumptions and parameters to estimate the effect of changes in program strategies. The ability to change target population coverage rates, for example, was incorporated in

the spreadsheets to enable an examination of the effect of changing these assumptions on future program funding requirements.

Policy Dialogue and Consensus-Building Presentations/Workshops

Graphic presentations, prepared for workshops based on the financial cost analysis and projections, were designed to solicit comments and suggestions, encourage policy dialogue, and build consensus on financing alternatives. Workshop materials, kept simple and focused, consisted of essential EPI and ARI cost and financing background information, a clear definition of the financial problems to be addressed, and a set of financing alternatives.

To avoid forcing the participants to struggle through large tables of numbers, graphics were used extensively to present numerical relationships. Pie charts, for example, were used to illustrate cost-component and funding-source shares, and time-series graphs were used for annual costs and funding forecasts to illustrate long-term financial requirements. Presentation materials were significantly modified following each workshop, based on the participants' comments and suggestions. A few examples of graphics used in the Philippines workshops are shown in Annex 2.⁵

The presentation/workshop process was based on a "bottom-up" approach, beginning with the DOH program offices, coordinated with USAID/Manila, extending to other related DOH offices, projects and programs, and ending with DOH senior management. The following gives the order, participants and general purpose of the presentations/workshops at each level:

- DOH EPI and ARI Program Offices. Results of the financial costing, forecasts, and analyses were presented to DOH program staff to ensure that the analyses accurately depicted EPI and ARI baseline costs, funding, program goals and strategies, and financing alternatives.
- USAID/OPHN/REACH. Presentations/workshops were conducted with OPHN health officers, staff and REACH personnel for comments and suggestions on key EPI and ARI financing issues, definition and assessment of financing alternatives, and presentation materials.
- Related DOH Offices. Presentations/workshops were conducted with personnel from the Health Policy Development Program (for comments, suggestions, and coordination on EPI and ARI financing alternatives) and from the Local Government Assessment and Monitoring Service (for local government devolution issues pertaining to EPI and ARI).
- Other Related Projects and Programs. Presentations/workshops were conducted to solicit comments and suggestions on EPI and ARI financing issues and alternatives

⁵A complete set of presentation graphics used in the workshops conducted in the Philippines for vaccine procurement planning is contained in Schwartz, J. Brad, "EPI/ARI Strategic Financial Planning: Trip Report, November 23 - December 16, 1992." Arlington, VA: The REACH Project, John Snow, Inc.

from other interested parties, including the DOH Child Survival Program, Health Finance Development Project, and Health Policy Development Project.

- DOH Management Committee. A presentation was made for the DOH Secretary, senior DOH staff, and donor representatives concerning policy dialogue, assessment of alternative financing mechanisms, consensus-building, and decision-making.

Assessment of Alternative Financing Strategies

A menu of alternative financing strategies for future funding requirements of the Philippines EPI and ARI programs was initially developed and then refined in the workshops described above. Workshop participants discussed the advantages and disadvantages of each financing alternative, and then reached conclusions and recommendations by consensus.

To some extent, the financing alternatives include choices that depend on program characteristics (e.g., user fees for immunizations) and the country situation (e.g., whether the country has a government-sponsored health insurance scheme). The financing alternatives developed for the Philippines, however, are illustrative of the types of alternatives that may be examined in other countries for EPI and ARI, as well as for other public health programs like CDD.

Below is a general discussion of the advantages and disadvantages of various financing alternatives for EPI and ARI programs that were identified in the workshops, drawing on the Philippines EPI and ARI experience for specific examples of policy issues, dialogue, and consensus.

Increased Donor Support. The obvious advantage of increased donor support to finance projected program shortfalls is that such support is a "free" source of financing to the public sector program. The obvious disadvantage is that donor support is likely to be too unpredictable for sound financial planning and to ensure sustainable programs.

Just prior to the start of the financial planning exercise in the Philippines, the DOH requested that donor agencies increase vaccine funding--with little success. In a key informant interview, one donor agency representative stated that because EPI had achieved high coverage rates, it was time for DOH to take on increased responsibility for the program and that the donor agency was interested in funding "more pressing problems with higher visibility." DOH personnel agreed almost unanimously that the DOH should assume greater responsibility for the procurement of vaccines rather than continuing to rely heavily on donors.

In workshops, the general consensus was that the DOH should continue to encourage and accept donor contributions to EPI and ARI but that other financing alternatives should be developed for short- and long-run program sustainability.

Increased DOH Recurrent Budget. The advantage of including program support in the recurrent public health budget is that such a commitment from the government would increase the likelihood of long-term sustainability of the programs. The disadvantage is that a DOH budget is essentially a "zero-sum" game. That is, unless the overall DOH budget is increased to accommodate projected funding shortfalls, the required resources would have to be obtained from decreases in other DOH

programs. Even if the overall DOH budget is increased, such an increase would come at the expense of other non-health national government agencies like education, public works, and defense.

The workshop consensus was that the current political climate appeared to be very favorable for obtaining increased funding from the GOP for the DOH overall and for immunizations in particular. It was felt that this should be pursued as a viable financing alternative for sustainability.

Insurance Provision of Immunizations and ARI Medicines. Some developing countries have public-sector health insurance systems. In the Philippines, about 40 percent of the population participates in a government-sponsored health insurance system (MEDICARE) through payroll deduction. Financing immunizations through this type of insurance scheme essentially would be "free" financing to the DOH. It was estimated that because the insurance participants have fewer children per family than non-participants, in the range of 30 to 35 percent of children could be covered if the system provided immunizations as part of outpatient services. The covered population obviously would increase over time as the proportion of the population insured increased. The cost of ARI medicines could also be included under outpatient services.

The problem with financing immunizations and ARI medicines through this type of government-sponsored insurance scheme is that, in most countries, it would require an administrative change in the benefits provided to the insured. MEDICARE, for example, does not currently provide outpatient services, but a demonstration project is being planned to test the feasibility of offering such services. Moreover, an analysis of the additional cost to subscribers for adding immunizations and ARI medicines to the benefits of the insurance system needs to be conducted prior to implementation.

The workshop consensus was that the administrative changes required for MEDICARE to provide immunizations and ARI medicines, as well as the costs to subscribers, should be further investigated, then instituted, if possible.

User Fees. The advantage of charging fees for immunization and ARI treatment is that the costs of vaccines and ARI medicines could be recovered. This is only the case, however, if people are willing and able to pay. Another problem with implementing user fees is that in countries that have decentralized health systems, a central-level DOH has no direct control over the point of service delivery. Even if local governments could be coordinated to charge user fees, there is likely to be no administrative mechanism in place to "pass back" revenues recovered from fees to the DOH. In addition, and perhaps more importantly, many governments have a policy of providing immunizations to the population free-of-charge, and local discretion to charge fees would run counter to this policy.

Because President Ramos had publicly endorsed a free immunization policy just prior to the start of the financial planning exercise, the consensus opinion was that user fees were not politically feasible at that time in the Philippines. Also, if user fees are ever to be considered seriously, research is needed to determine the willingness-to-pay for immunizations and ARI treatment, as well as the feasibility of means-testing or an equivalent system to protect those who are not able to pay.

Revolving LGU Vaccine and Medicine Fund. The establishment of a revolving local government drug fund would provide a cost-recovery option for the DOH for vaccines, needles and syringes, and

ARI medicines. The DOH would purchase supplies in large quantities to obtain large-lot discounts and, in turn, sell them at cost to local governments. Proceeds from the sales to local governments would be reserved in a fund dedicated to future purchases. Local governments would have the option either to provide the immunizations and medicines free-of-charge or to charge a fee to recover their costs.

One problem with a revolving fund is the potentially large administrative costs to set up and administer it. Secondly, if all local governments provide immunizations free-of-charge in line with stated government policy, then the DOH will have passed on a large proportion of the cost of immunizations to the local governments. Some local governments may not be willing to purchase vaccines without increases in their budgets, which would lead to a deterioration of vaccine coverage rates. And if some local governments charge user fees but others do not, then equity in access to immunizations would be compromised.

The workshop consensus was that this financing alternative should be further explored if direct funding through the DOH recurrent budget is not sufficient to cover the funding shortfall for vaccines and ARI medicines.

Shift DOH Resources from Curative Care. Public health care resources could be shifted from curative care to preventive care to finance vaccines. Through a process of privatization of hospitals or charging fees for curative care, the DOH could reduce the amount of resources currently providing curative care and use those resources to fund vaccine procurement.

The problem with this alternative, at least in the Philippines, is that the revenue base for such a shift has been drastically reduced due to the government devolution. The large majority of hospitals, some 400 of 450 total public hospitals, have been devolved to LGUs. The remaining hospitals under DOH control consist of some specialty hospitals that already are nearly self-sufficient, sanitariums with little cost-recovery potential, and regional hospitals. Thus, the revenue base has been decreased to the point that it is unlikely that significant resources can be shifted toward vaccine procurement, although the idea still has some merit. A problem that may be encountered in other countries is the political feasibility of reducing curative health care that is currently being provided free-of-charge.

Although the DOH is placing a higher priority on preventive services, the workshop consensus was that too few resources were likely to be available from curative care resource reallocations to make this a feasible alternative for EPI sustainability.

Endowment for Vaccines and Medicines. An endowment whose revenues from investments would be dedicated to the purchase of vaccines and ARI medicines could provide a sustainable source of financing for EPI and ARI. For example, if a fund in the Philippines could earn a 20-percent return, about the rate on simple certificates of deposit at the time of the workshop, then about \$20 million would be required to generate the \$4 million vaccine shortfall projected for Fiscal 1994. About \$50 million would be required to generate the \$10 million shortfall projected for Fiscal Year 2010.

Obviously, the major problem with an endowment for vaccines and ARI medicines is the initial source of investment funds. In addition, the endowment would be subject to market fluctuations and might, in some years, need to be supplemented with other funds to meet program requirements. The

workshop consensus was that this is not a feasible financing alternative in the Philippines because of a lack of initial funds to establish the endowment.

Expand Local Production of Vaccines. Some developing country governments produce vaccines locally. In the Philippines, the DOH currently produces BCG and tetanus toxoid in nearly sufficient quantities to attain national immunization coverage goals. It has been argued that if its production capacity and capability were increased, then the Philippines could become "independent" by producing its own vaccines.

There are several major problems with this line of reasoning. First, and probably most important, the capital requirement for the necessary investment in production is likely to be prohibitively large. A source of capital would be necessary for vaccine production, but no donor agencies have been willing to fund such an investment in the Philippines.

Second, even if the initial capital were available, it does not make good economic or financial sense for the DOH to invest in the local production of vaccines. As in any production process, the production of vaccines requires variable recurrent expenses for personnel, equipment, and supplies. These costs would have to be borne by the DOH in the recurrent budget. In order for these recurrent expenditures to be justified, the unit production cost of vaccine would have to be lower than the market price of vaccines available to the DOH. If not, then it would be less expensive to simply purchase vaccines on the open market through a competitive bidding process or through a bulk purchaser such as UNICEF.

In the Philippines the current unit cost of a dose of BCG and tetanus toxoid is about the same as the price that UNICEF charges for these antigens. It is unlikely that the Philippines could produce vaccine at a lower unit cost than charged by UNICEF or by private producers for large bulk purchases. Thus, it would be less expensive for the DOH to purchase vaccine than to produce its own vaccine.

Local production of vaccines may be a practical alternative for countries that have currencies that are not easily convertible in world markets and that have difficulty obtaining hard currency. The Vaccine Independence Initiative sponsored by UNICEF, however, may provide many countries with the mechanism to overcome currency conversion problems and avoid the high cost of local vaccine production.⁶

This financing alternative did not achieve a clear consensus of opinion from workshop participants. While there was some DOH and donor support for continuing to produce BCG and tetanus toxoid and to even explore the production of other antigens (despite of the obvious cost drawbacks), others supported discontinuing the production of vaccines entirely.

⁶The Vaccine Independence Initiative (VII) is a relatively new UNICEF program that allows host governments to use local currency to purchase vaccines through UNICEF. UNICEF uses hard currency to purchase the vaccines through world markets and uses the local currency in the host country to pay its local operating expenses. Thus, UNICEF effectively converts local currency into vaccines for the host government.

Efficiency Gains. Rather than increasing the DOH recurrent budget, it is possible that current DOH health services could be made more efficient. By eliminating waste, resources could be made available for the purchase of vaccines in the recurrent budget. But while some efficiency gains are likely, the process of identifying and capturing sufficient efficiency gains may be extremely difficult in any country. In the Philippines, the workshop consensus was that this was not a viable alternative to ensure program sustainability.

In summary, workshop participants generally concluded that it was desirable to include funding for the vaccine shortfall and ARI medicines as line items in the recurrent national-level DOH budget to ensure the long-term sustainability of these programs. For Fiscal Year 1993, the combined vaccine funding shortfall for EPI and the cost of the national supply of ARI medicines represented less than two percent of the total DOH budget. Funding for these items in the recurrent budget could be obtained by increasing the overall size of the DOH budget from an increased GOP allocation or by shifting DOH resources from curative care. If these alternatives were not possible, then an alternative recommendation was to establish a revolving fund that would sell vaccines and ARI medicines to the local governments and/or to seek an administrative change to provide immunizations and ARI medicines through the government insurance system.

In the case of needles and syringes for EPI at the local government level, the workshop participants concluded that the local governments should purchase these items, as required by the DOH rules and regulations for implementing the devolution. For Fiscal Year 1993, it was calculated that needles and syringes account for about one percent of total health care costs for local governments and thus do not represent a major cost burden. In addition, it was determined that the local governments would receive about \$4 for EPI services (vaccines, cold chain, training, logistics, etc.) from DOH for every \$1 that they spent on needles and syringes in support of the program. This "return" to local governments from an "investment" in needles and syringes acts as an incentive to support the nationwide EPI effort, much in the same way as a matching grant from a central government stimulates local government investment.

Applicability to Other Countries and Programs

The financial planning process developed and tested in the Philippines for EPI and ARI is generally applicable to other countries and other public health programs. It is important to note, however, that health sector financing patterns in each country (including the characteristics of the public and private health sector financial mechanisms; the mix, profile, and level of donor support; and individual program cost and financing characteristics) must be taken into consideration during the financial planning process. Other countries are likely to have different financing issues and alternatives for EPI and ARI, as well as for other health programs. A critical part of the financial planning process is to accurately determine these key issues in order to focus the process on the essential problems and possible solutions.

Program-component cost shares, for example, are likely to be significantly different in countries that have a fully centralized public health system or that have devolved a different set of health services to lower levels of government. In other countries, the cost of cold chain equipment and maintenance, personnel, training, social marketing, or other components may be the essential funding issue for EPI. Other types of shared public/private health insurance schemes may be present that

could offer possible sources of alternative financing for immunizations or ARI medicines.

IV. CONDITIONS FOR SUCCESS

The experience gained in the Philippines EPI/ARI strategic financial planning exercise can be used to generalize the necessary conditions for success using this type of technical assistance in other countries and for other public health programs. The criterion used here to define a condition for success is whether it increases the likelihood that a meaningful policy dialogue is achieved and that financial policy decisions are taken to increase the sustainability of the program.⁷

The conditions for success, discussed here in general terms, are not mutually exclusive. The combination of conditions specific to each country and program must be taken into account to assess the likelihood of success in applying the process. Examples from the Philippines experience for EPI and ARI are used to help clarify the general conditions.

Factors that are likely to influence whether the process is successful include the following (not listed in order of importance):

- the presence of a pre-existing financing issue or problem,
- the level of government commitment to the financial planning process,
- the policy-making environment,
- the level of government commitment to the program,
- the level of donor (sponsor) commitment to the process,
- the existence of appropriate counterparts,
- the demand for program services,
- the maturity and success of the program,
- the size of the program, and
- the qualifications of the task leader for the financial planning process.

⁷This is not to say that the process is unsuccessful if it fails to result in a financial commitment by the government to sustain the program through some financing alternative, only that the factor is a condition for success because it will increase the likelihood of this result.

Pre-Existing Financing Issue or Problem

A well-defined, pre-existing financial problem or financing issue is necessary to engage stakeholders in a policy dialogue. It is extremely difficult to get people interested in talking about how to solve a financial problem if there is not a well-defined problem at the outset of the exercise. If, for example, donors have merely threatened in the past to cut back program funding but have always backed down and extended funding commitments, then no one in the host government will consider financial sustainability as a serious issue. On the other hand, if there is a serious financial crisis, either at the present time or on the horizon, then a convincing argument may be made to engage policy makers in a meaningful exchange.

In order to capture the attention of stakeholders, the strategic financial planning exercise must define the pre-existing financial problem in a way that will highlight its severity. Conveying a sense of impending doom from a "sky-is-falling," serious financial problem, given that one accurately states the severity of the problem, is more likely to prompt a policy dialogue than if one simply assumes that everyone understands and appreciates the issues involved. The forecast of program costs, commitments, and funding shortfall in the short, medium and long run underscores the future financial sustainability issue and helps to prompt the government into addressing the problem.

An obvious corollary to this condition for success is that the more severe the problem--defined in terms of how threatened the program is for continuation or in terms of the amount of backsliding from gains achieved in the past--the more likely the planning process will be taken seriously by the parties involved and the findings ultimately used.

Common examples of pre-existing financial issues or problems include funding shortfalls due to donor or government cutbacks and the negative effects of devolution on program funding at various levels of government. These are basic sustainability issues with large implications for the future success of the program. In the Philippines, for example, there was a large shortfall projected for vaccine procurement due to declining donor funding and a lack of funding for ARI medicines at the local government level, with both of these issues complicated by the devolution.

Government Commitment to the Financial Planning Process

The financial planning process is unlikely to be effective without a strong government commitment to the process itself, that is, a willingness of DOH staff and management to meet and discuss the financial planning of the program, to explore and pursue options, and to act on a solution to the problem. It must be clearly understood by the host government, prior to the technical assistance, that the purpose of the financial planning exercise is not simply the production of financial analyses and projections but a planning process that seeks policy dialogue and problem resolution. Indicators of this condition are not only initial government concurrence and request for the financial planning exercise but also the commitment and involvement of government officials who have the authority to implement alternative financing decisions and commit resources.

Policy-Making Environment

A flexible policy-making environment that is conducive to changes in health financing policy,

especially in tandem with a strong government commitment to the financial planning process, increases the likelihood that the process will be successful. In the Philippines, a change in GOP and DOH administration about six months prior to the financial planning exercise resulted in an environment which favored the consideration of new approaches to health care financing and an emphasis on funding preventive health care services. At the same time, the USAID-sponsored Health Finance Development Project called attention to overall health sector financing issues and created additional forums for health financing policy dialogue. Taken together, these events helped to create an environment that supported and reinforced the financial planning process for EPI and CARI.

Government Commitment to the Program

If the host government has demonstrated a prior financial commitment to the program, then the financial planning process is more likely to result in a meaningful policy dialogue that leads to actions designed to sustain the program. A government is more likely to pay attention to the future financial viability of a program if it has a vested financial interest in its success and does not rely exclusively on external funding for the program.

Indicators of government preference for a program include: (1) a pre-existing program plan that is being implemented; and (2) a significant commitment of government resources to the program relative to other programs and to donor funding. Positive general indicators for preventive health programs like EPI in particular include government priority for (1) preventive care relative to curative care in the health budget and (2) primary health care over secondary and tertiary care in the health budget.

Donor (Sponsor) Commitment to the Process

The donor agency that sponsors the strategic financial planning process must be willing to commit the necessary resources and have the patience to allow the process to positively affect policy. Because it takes time, the financial planning process described in this paper is more expensive than other short-term technical assistance. To expect instant success from one-stop, short-term financial planning technical assistance is a recipe for failure. Completing all the steps, especially the policy dialogue steps that build consensus for decisions and action, requires several trips over an extended period. Policy making based on structured policy dialogue is an evolutionary process that requires repeated sessions to allow for changing conditions and to iterate toward a financing solution.

In the Philippines, the process required three one-month missions, with a significant amount of time spent by the task leader between trips developing financial models, spreadsheets, and analyses. Similar financial planning exercises in other developing countries may require more or less time, depending on the complexity of the setting, complexity of the financing issues, characteristics of the programs examined, number of stakeholders, level of consensus on key financing issues at the outset of the exercise, number of feasible financing alternatives, etc.

In addition, because the sponsoring donor agency is likely to have a vested interest in the outcome of the exercise, it is important that donor personnel become actively involved in the process by being interviewed, making key introductions to other stakeholders, and participating in policy dialogue

workshops. Indicators of the sponsoring donor's commitment is mission concurrence and financing of the process and active participation in the exercise.

Appropriate Counterparts

Appropriate local counterparts to carry out the financial planning process on an ongoing basis increases the chances that the program will be sustained by the host government. The process, consisting of analyses and projections coupled with policy dialogue, has to occur as targets of opportunity appear, especially during the appropriate times in the budget planning cycle. The process cannot be conducted entirely by a task leader who is in the country only periodically. Moreover, the process needs to be institutionalized within the host government agency for continued program financial planning and advocacy after the initial process is completed.

The ideal counterparts are program advocates as well as analysts. As noted earlier, financial analyses of programs alone are not sufficient to stimulate policy dialogue and decisions. Thus, counterparts or their staffs need to be skilled not only in the financial analysis methods but also to be willing and constant advocates for the program. Well-informed, capable, and dedicated DOH program managers and staff who have access to program information, analysis skills, and good relationships with other key DOH personnel and donors are likely to be excellent counterparts. Moreover, the likelihood of success is increased greatly by a program advocate or champion in a senior position of influence within the DOH to validate the process, open stakeholder and data doors, and ensure that follow-up on actions is carried out.

Demand for Program Services

A well-established program that provides health services expected by a large percentage of the population as part of the menu of public health services is more likely to engage stakeholders in financial policy dialogue and receive a financial commitment for sustainability from the host government.

In the Philippines, for example, immunizations have been provided by the public health sector from a highly successful EPI that has attained a fully immunized child rate of about 90 percent in 1992. Such well-known programs are more likely to win political favor for funding and to get attention if financially threatened, because there is effective demand by the population for program services. The CARI program, in contrast, is not yet well known or accepted even by the Philippines' medical profession, much less by the population. It is more difficult to achieve a consensus on the desirability of a program whose services are not yet in high demand, and therefore it is more difficult to get a financial commitment for continuing the program. An indicator of the demand for program services is the extent of coverage of the intended population.

Maturity and Success of the Program

Closely related to the demand for program services is the maturity and success of the program. Public health service programs like EPI and CARI go through a program life cycle. Programs begin with initial conceptual development and then progress through stages of implementation and growth until long-run program goals are attained and finally sustained over time. More mature programs

are more likely to be culturally and operationally established in the health service delivery system, accepted by the population, and proven over time to be a worthwhile investment of health resources. Thus, more mature and successful programs are more likely to receive funding for sustainability when funding shortfalls are forecast. Less mature programs are less likely to be candidates for increased funding because they may have not yet proven their full potential or effectiveness in improving the health status of the population.

An indicator of the maturity of the program is its implementation stage, not necessarily the length of time that the program has existed in some form. The success of a program can be measured by indicators specific to program goals. In the Philippines, EPI has nearly reached full maturity where long-run coverage goals for most of the basic set of antigens are met or are being approached, and ambitious new strategies for eliminating the wild polio virus and increasing coverage for hepatitis B are being implemented. CARI is still in the early stages of implementation.

Size of the Program

The larger the program relative to the total health budget, the more likely it will receive a financial commitment from the host government. Assuming the program is worthwhile and accepted by the population, larger programs have a higher visibility and political payoff to stakeholders than relatively smaller programs (or programs in the early stages of implementation). An indicator of a program's relative size is its proportion of the total health budget relative to other programs.

Task Leader Qualifications

A task leader who has the skills, knowledge and experience to conduct this type of financial planning process increases the likelihood that a meaningful policy dialogue will be achieved and financial policy decisions will be taken to increase the sustainability of the program. In addition to essential skills in financial modeling and analysis, health economics and finance in developing countries, it is critical that the task leader have experience in rapid assessment to size up the country and program situation quickly and accurately and to determine the key program issues and vested interests. The task leader must also have diplomatic skills and experience as a facilitator to conduct presentations/workshops that build consensus through policy dialogue.

V. RESULTS AND NEXT STEPS

The expected result of the strategic financial planning process in the Philippines was that the DOH and donor agencies would be informed about the future financial requirements of the EPI and CARI programs and would engage in a policy dialogue of alternative financing mechanisms that led toward a consensus. In this regard, this strategic financial planning process was a success, although much work still remains to ensure the long-term sustainability of the programs.

Since the beginning of the exercise, the DOH has increased its share of program funding to include virtually all of the projected vaccine shortfall for EPI for Fiscal Year 1993. This amounts to nearly \$3 million for routine OPV and hepatitis B vaccine. The DOH also committed itself to procuring the national requirement of ARI medicines for Fiscal Year 1993, about \$0.6 million. These

increased funding commitments in the DOH recurrent budget significantly increase the likelihood that these programs will be sustained.

Prior to the exercise, DOH only funded about 25 percent of the total vaccine requirement through the production of BCG and tetanus toxoid and the purchase of hepatitis B. However, although the DOH increased its funding of vaccine to 43 percent of the total vaccine funding requirement for Fiscal Year 1993, the remaining 57 percent (nearly \$4 million) is contributed by donor agencies. Thus, there remains a significant reliance on uncertain donor contributions for the success of EPI. Even with \$4 million in donor commitments, however, there is a projected vaccine shortfall of over \$4 million for Fiscal Year 1994, increasing to over \$10 million for Fiscal Year 2010, that needs to be addressed. It also remains to be seen whether local governments will fund sufficient quantities of needles and syringes to fully support EPI, or whether DOH will have to augment the supply of needles and syringes to ensure that immunization coverage goals are met.

Longer-run resource allocation decisions also need to be made for the sustainability of CARI. Once the program is fully implemented and institutionalized, a decision needs to be made about the financing alternatives for ARI medicines. Should DOH continue to supply all ARI medicines, or should local governments assume responsibility at some point in the future? Are there other feasible financing alternatives?

Changing government and donor commitments, new programs and strategies, and the effects of the devolution in the Philippines contribute to a dynamic financial environment that must be continuously monitored and evaluated. Because the DOH budget planning cycle is on an annual basis, the funding requirements and donor commitments for each of these programs need to be re-examined annually for continued resource allocation decisions.

Clearly, a strategic financial planning process needs to be fully institutionalized within DOH for rational resource allocation decisions to support program sustainability, not only for EPI and CARI, but for the entire portfolio of health programs. Donor agencies can support this initiative through technical assistance that transfers the financial planning process and analysis methods. In addition, donor agencies can aid program sustainability through technical assistance that helps with policy, legal and regulatory reform to foster public and private health sector financing alternatives.

Annex 1

Philippines Vaccine Dose Assumptions

OPV

- Routine: Total population¹ x 3% (< 1 yrs old) x 3 doses x 1.67 wastage.
- ORI: Total population x 40% (< 15 yrs old) x 1/100,000 = # of estimated Acute Flaccid Paralysis (AFP) cases/year
AFP x 2,000 children x 2 doses x 1.1 wastage. ORI for polio is assumed not to be required after 2004.
- NID: Total population x 14.5% (< 5 yrs old) x 2 doses x 1.1 wastage x 90% target.

DPT

- Routine: Total population x 3% (< 1 yrs old) x 3 doses x 1.67 wastage.

Measles Vaccine

- Routine: Total population x 3% (< 1 yrs old) x 1 dose x 2.0 wastage.
- SI: Total population x 4% (9 months - < 2 yrs. old) x 1 dose x 30% service target x 1.1 wastage.

Tetanus Toxoid

- Routine: Total population x 3.5% (pregnant women) x 2 doses x 1.67 wastage.
- SI: Total population x 3.5% (mothers w/ children < 5 yrs old) x 2 doses x 1.1 wastage.
6.25% buffer stock to be established in 1993.

BCG

- Infants: Total population x 3% (< 1 yrs old) x 1 dose x 2.5 wastage.
- School Entrants: Total population x 3% (school entrants) x 1 dose x 1.33 wastage.
6.25% buffer stock to be established in 1993.

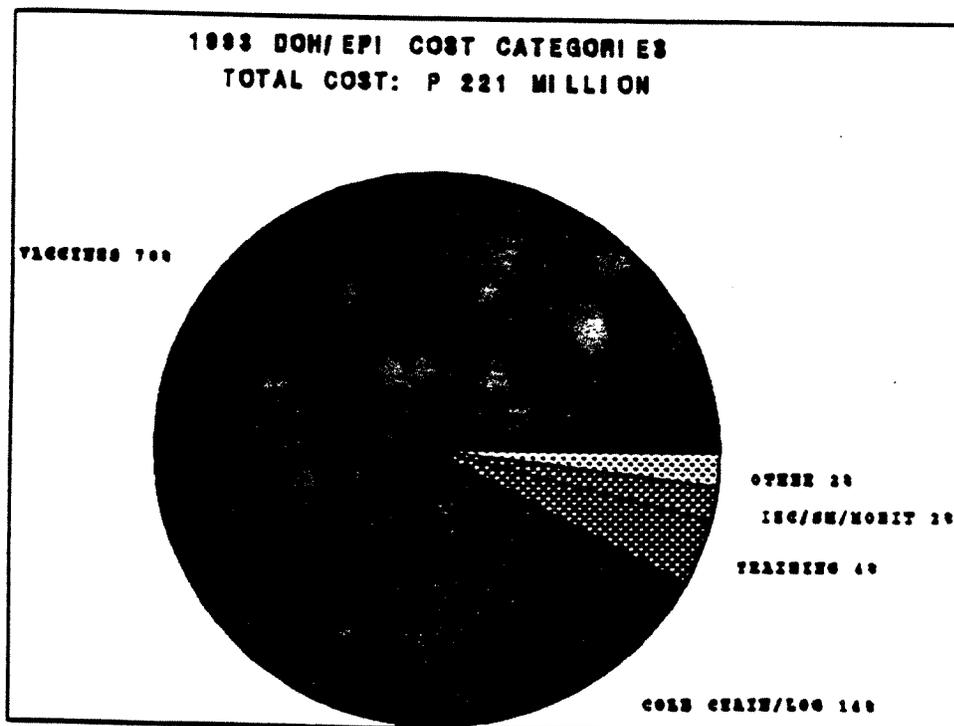
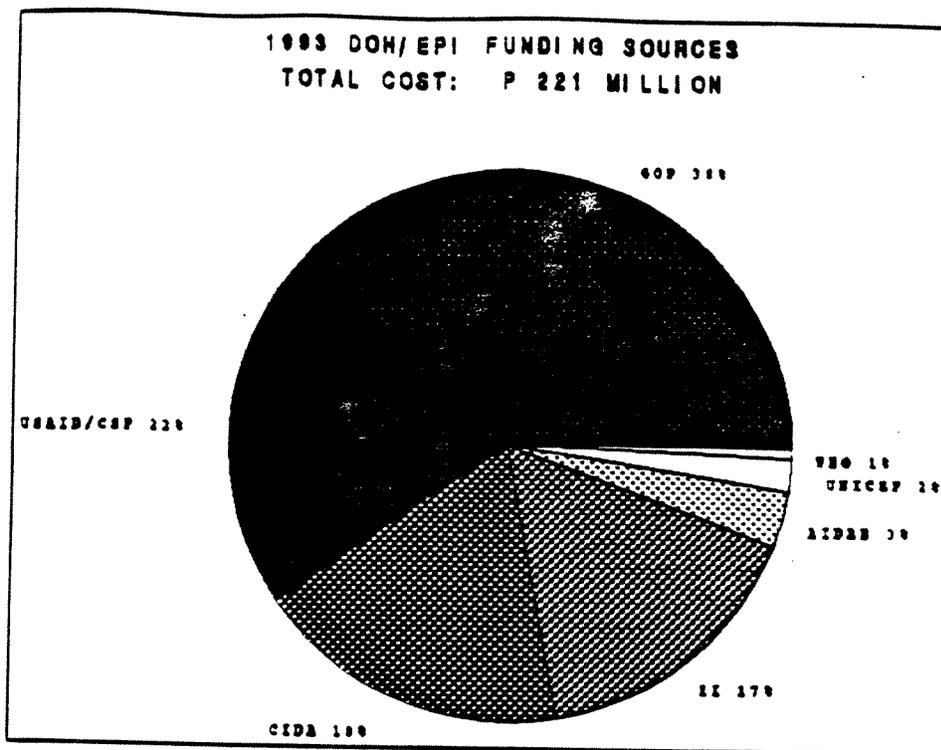
Hepatitis B

- Routine: Total population x 3% (< 1 yrs old) x 3 doses x 1.2 wastage x 50% service target (1993).
- Service Targets: 1994 - 60%; 1995 - 70%; 1996 - 80%; 1997 - 90%; 1998 - 100%
6.25% buffer stock to be established during 1993 - 1995.

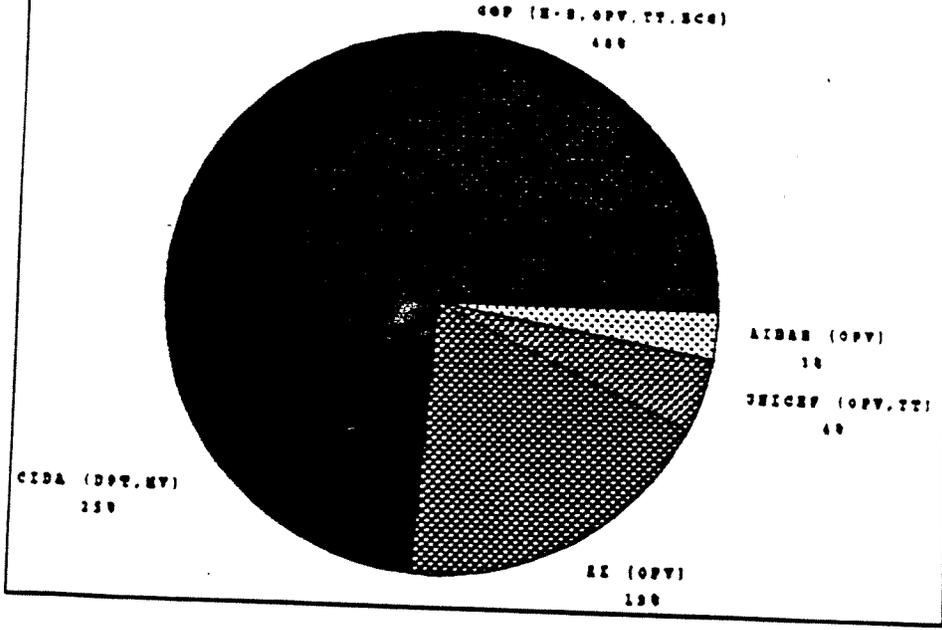
¹Total population is assumed to increase by 2.3% per year.

Annex 2

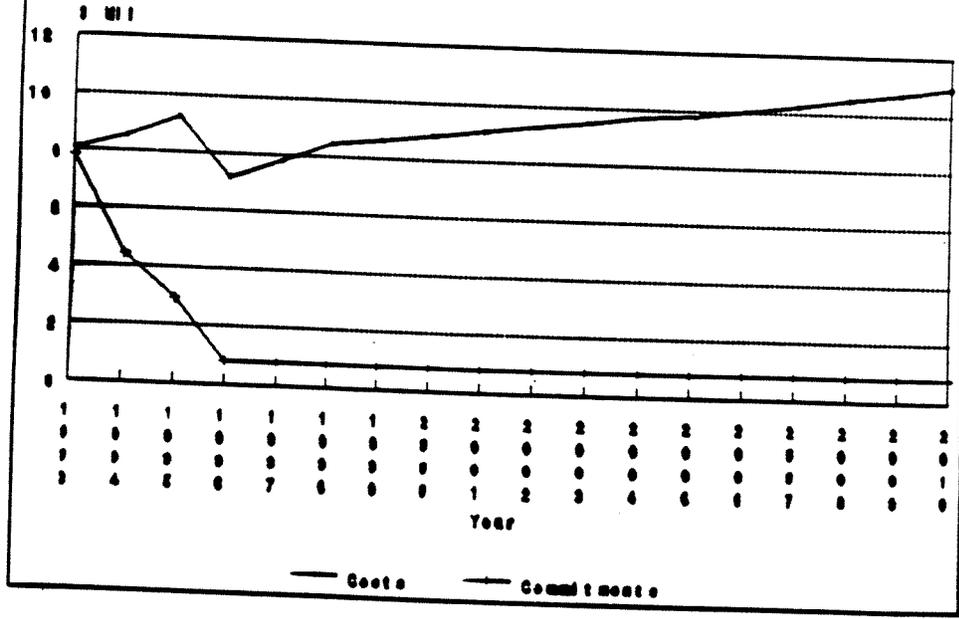
Examples of Presentation Graphics

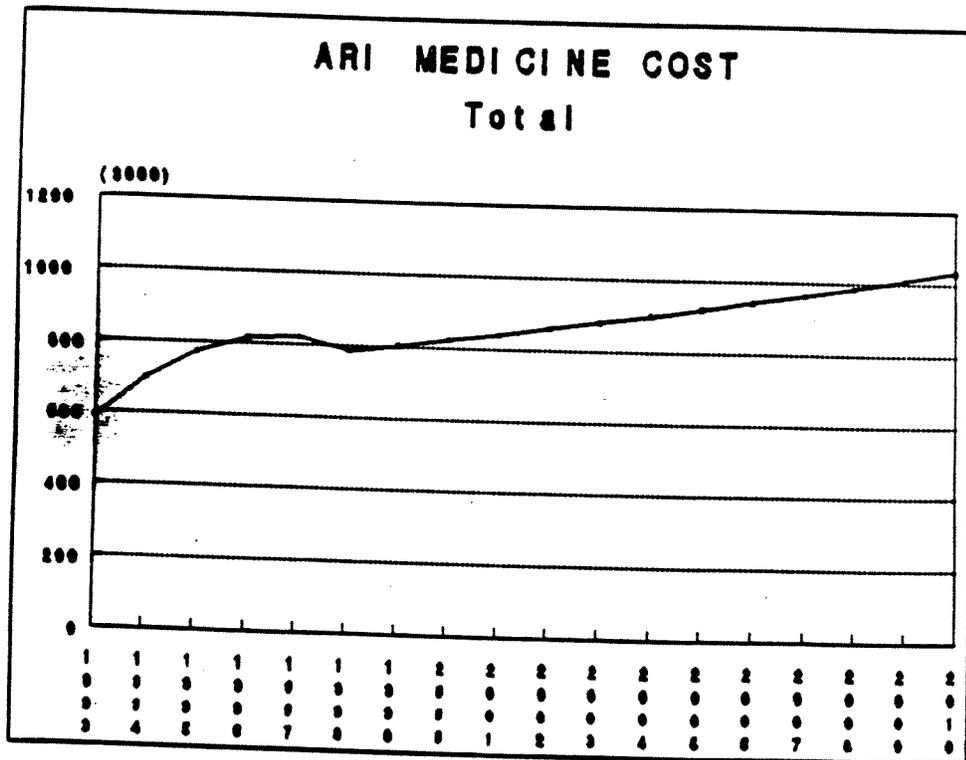
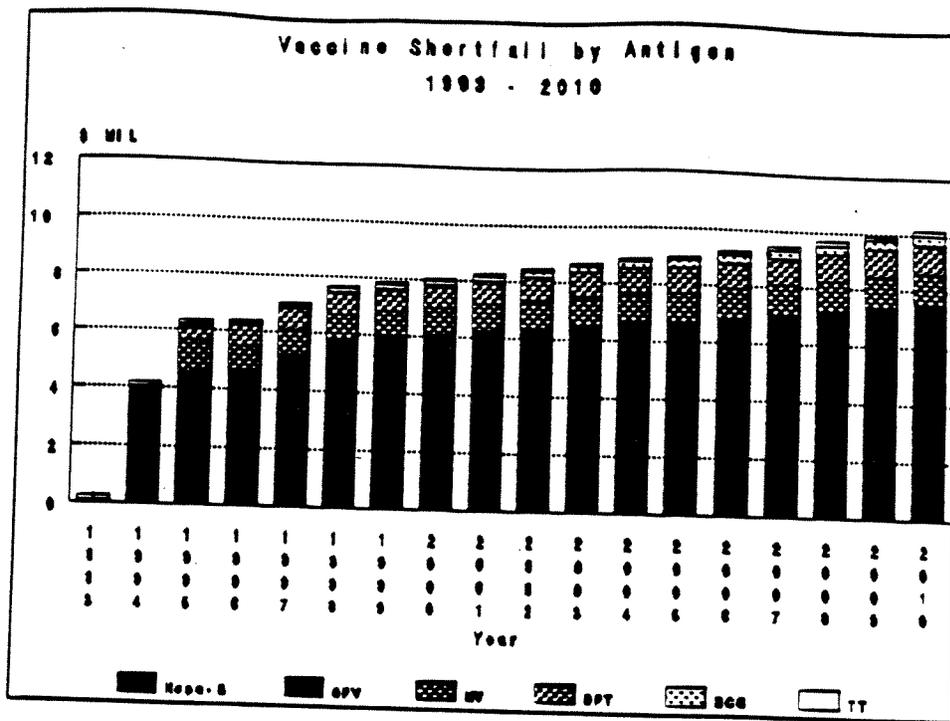


1993 DOH/EPI VACCINE FUNDING SOURCES
 TOTAL COST: P 172 MILLION



Total EPI Vaccine Costs and Commitments: 1993-2010



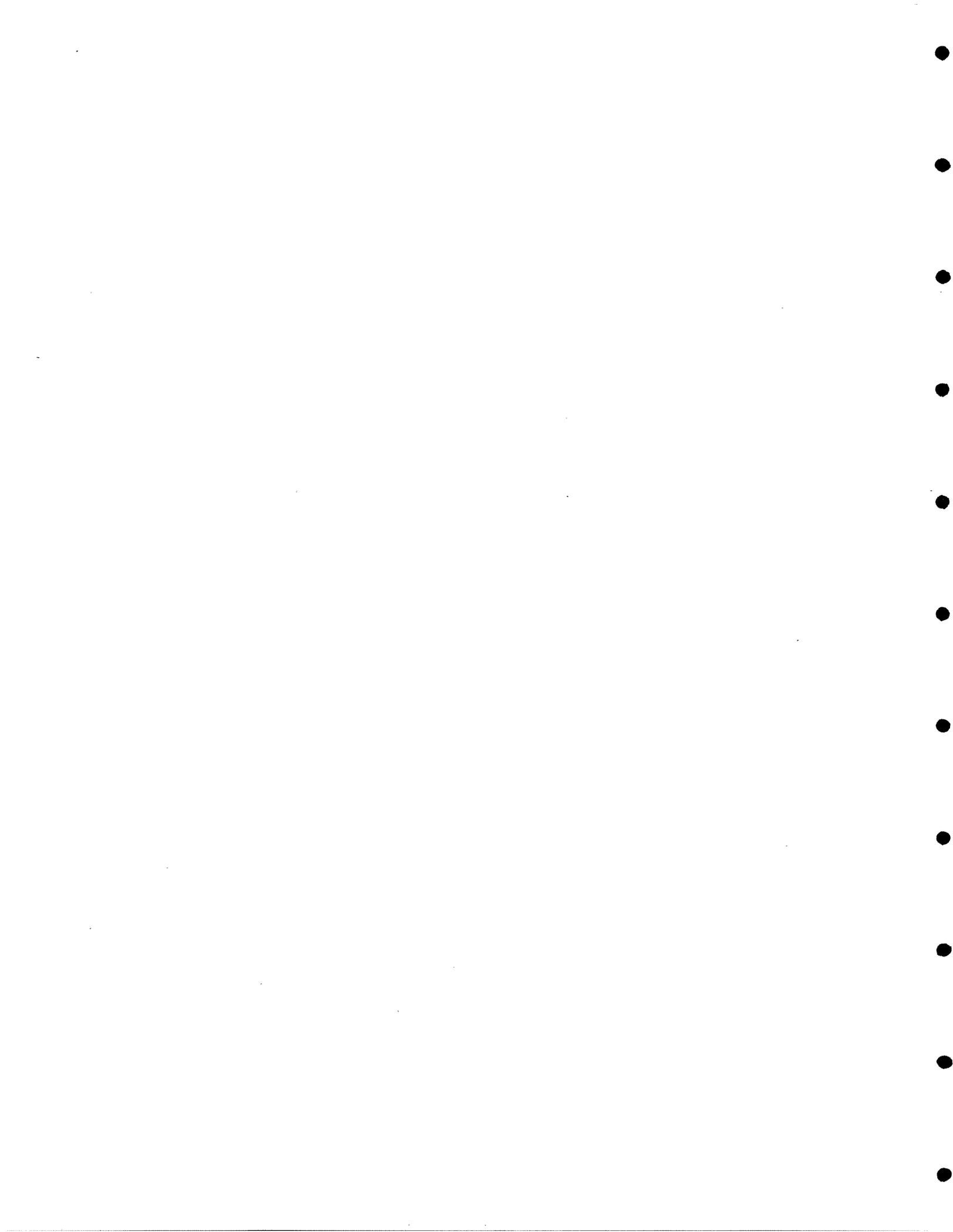


**MANAGEMENT INFORMATION,
MONITORING AND
SUPERVISION TO IMPROVE
QUALITY OF
IMMUNIZATION PROGRAMS**

Mark Weeks
Technical Officer

The Resources for Child Health (REACH) Project
John Snow, Inc.
1616 N. Fort Myer Drive, Suite 1100
Arlington, VA 22209

A.I.D. Contract No.: DPE-5982-Z-00-9034-00



I. EXECUTIVE SUMMARY

EPI managers rely on quantitative measures -- chiefly immunization coverage rates -- as their primary indicators for monitoring program performance. However, indicators of the true protective effect of each immunization ("quality indicators") are extremely important as well, particularly as international attention turns towards the control of specific diseases. To encourage monitoring of the quality of performance as well as quantity of activities, REACH has provided substantial technical assistance to promote monitoring systems and the use of indicators which assess quality -- adherence to age and interval policies, "valid" coverage as opposed to crude coverage, drop-out rates, and missed opportunities for immunization. REACH developed information management software, taught the use and applications of computer software in program management, and strengthened manual, field-based monitoring systems at district and local levels in a number of countries.

II. COVERAGE SURVEY ANALYSIS SYSTEM (COSAS)

REACH Activities

The most widely used method for assessing EPI performance is the World Health Organization (WHO) 30-cluster immunization coverage survey. Although managers and evaluators tend to focus primarily on the coverage rates derived from this survey, considerably more information can be gained from in-depth analysis of the data.

Computer software for analyzing data collected by the WHO 30-cluster immunization coverage survey has been available since 1986. In 1988 WHO and EPICENTRE released the first version of Coverage Survey Analysis System (COSAS), the most widely used immunization coverage survey analysis software. COSAS facilitates analysis by rapidly processing the data and by illustrating the results in tables and graphs.

To guide EPI managers and policy makers in interpreting the results of COSAS, REACH produced a manual in 1991 (Management and Evaluation of Immunization Programs through the Use of Coverage Surveys and Computerized Analysis) and conducted a three-day training workshop in Washington on this topic. The manual describes practical applications for the information generated by COSAS. To assist district-level managers and those less familiar with statistical analysis, REACH also developed a template which simplifies the reporting of the COSAS results in both tabular and narrative form.

In addition, REACH provided technical assistance on immunization coverage surveys in nine countries -- Bangladesh, Burkina Faso, Cambodia, the Dominican Republic, India, Kenya, Niger, Nigeria, and Tanzania. This assistance involved not only training and supervising survey teams and ensuring the reliability of the data collected, but also developing a set of indicators for interpreting the data and promoting more in-depth analysis of the results by the EPI managers through COSAS. Analysis included the interpretation of indicators which address program quality, such as access to services, missed opportunities for immunization, and adherence to the immunization schedule.

Discussion

Using survey results to go beyond immunization coverage rates enables managers to identify and address the quality of EPI performance. In both Kenya and Nigeria, exclusive reliance on crude coverage rates and routine coverage data suggested relatively high immunization coverage. It obscured, however, a serious drop-out problem, inappropriate ages and intervals for many child immunizations, and very high rates of missed opportunities due to refusal to immunize sick children, despite national policies to the contrary. For example, in one district in Kenya, the COSAS analysis showed that as many as 17% of the children vaccinated against measles may not have been protected because they were vaccinated below the minimum age for measles vaccine.

COSAS analysis in both Kenya and Nigeria showed that a lack of child and TT immunization cards among mothers prevented reliable documentation of the immunization status of many children. These findings resulted in actions toward improving immunization card distribution and retention. High drop-out rates revealed by the graphic presentations led to major efforts to reduce drop-out rates in both countries. In Cambodia, where the EPI faces formidable obstacles and immunization coverage is low, morale in the Ministry of Health and among donors was boosted considerably when the COSAS results showed that at least access to immunization services had been greatly improved.

While the information generated by COSAS gives a more in-depth perspective on program performance, this additional information can be overwhelming to those not familiar with data analysis. Interpreting COSAS in detail requires the use of specific terminology, such as "crude," "valid," and "continuity," with which managers and policy makers may not be familiar. The distinction between "crude" coverage (immunizations given as reported by the caretaker or documented) and "valid" coverage (immunizations given according to program policy and documented) becomes confusing to those accustomed to reporting only in general terms. Although both the interpretation manual and the reporting template developed by REACH help to simplify terminology and interpretation, *technical assistance and in-country training courses are still necessary in most cases for more in-depth analysis and use of COSAS results, particularly for inexperienced users.*

Crude coverage is used in standard international reporting yet valid coverage is much more useful for program management. Some managers, policy makers, and funding organizations, however, are reluctant to calculate valid coverage because this indicator from survey data results in lower coverage rates. After so much emphasis by donor and political communities on achieving high coverage, reporting of better defined and more valid coverage rates could lead to an incorrect interpretation of an exaggerated decrease in immunization activity. Nonetheless, it has been encouraging to see that in countries receiving assistance from REACH, findings from critical analyses have been included in survey reports and used to formulate strategies for improving the quality performance.

III. COMPUTERIZED EPI INFORMATION SOFTWARE - CEIS

REACH Activities

Beginning in 1987, REACH has worked in collaboration with WHO's Expanded Programme on Immunization (WHO/EPI) on the development of a computer software program that facilitates analysis and presentation of data on immunization coverage and the EPI diseases. This Computerized EPI Information System (CEIS) software is based on a prototype developed in 1986 by the WHO South East Asia Regional Office (SEARO). CEIS allows for easy data input, editing, and report generation on several topics: immunization coverage, EPI diseases, training courses held, immunization coverage surveys, funding, and population. CEIS also produces graphs on immunization coverage and on cases of EPI diseases and death caused by them.

The first REACH Project installed CEIS in a number of African and Asian countries. In 1990, REACH prepared a draft user's manual for the Kenya CEIS program (Computerized EPI Information System [CEIS], Version 4, Kenya, User's Manual, September 1990). This manual describes the immunization coverage reports and graphs produced by the Kenya CEIS and gives guidance on how the reports can be used. REACH also produced a manual for District Health Management Teams in Kenya on using the CEIS monthly reports generated by the EPI headquarters.

A REACH assessment of its work carried out in 1990 concluded that it was too difficult for local staff to modify existing versions of CEIS or to correct problems. In collaboration with WHO, REACH provided a computer programmer who began working on a "generic" version of the CEIS program that would eliminate these problems. In March 1993, REACH and WHO completed the generic version, CEIS 5. Subsequently, two additional modules were added -- one to facilitate installations and the other to upload data into the CEIS data base from other data bases, including the earlier version of CEIS. Unlike previous versions, this "generic" version, CEIS 5, can be installed and made site-specific without modifying the source programs. As a result, a computer programmer is no longer required for installing and setting up the program.

Building on the Kenya users' manual developed earlier, a REACH consultant worked with WHO Geneva to complete a draft users' guide for CEIS 5 in July 1993. This draft manual gives the basic instructions for installing, setting up, and running the program. The manual also provides guidance on applications for the reports produced by the program.

REACH contributed funds and technical support for two global meetings of CEIS users in 1990 and 1993. During these meetings, participants described their experiences and discussed ways for improving the program. During the 1993 meeting, participants received the generic version (CEIS 5) and a draft of the users' manual. They endorsed CEIS 5 and recommended that future development efforts focus on expanding the software's capabilities to link with other computer software such as EPI INFO, EPI Map, and LOTUS. The draft users manual is currently under review by users throughout the world.

Various versions of CEIS have been installed in more than 40 countries. REACH assisted with installing CEIS in Indonesia, Nepal, Bangladesh, Burkina Faso, Senegal, Madagascar, Turkey, Kenya, and at the WHO South East Asia and Western Pacific Regional Offices. Installation included

on-the-job training on identifying reporting needs and on using the program. In most countries the person responsible for the EPI management information system received the training.

Discussion

REACH's experience with CEIS indicates that:

1. *CEIS has contributed to more effective planning and management by promoting greater utilization of data by national EPI managers (see The REACH Experience, Computerized EPI Information System, 1990). In Nepal, for example, a cumbersome manual system obstructed even rudimentary analysis of district coverage data. Installation of CEIS gave EPI management access to reports and graphs on immunization coverage and the reported EPI diseases.*
2. *While the immunization component of the program has been well utilized, the disease surveillance component remains underutilized. Poorly developed disease reporting systems contribute to the lack of utilization of this component of the program. This association illustrates the fact that a computerized system cannot overcome the deficiencies of an inadequate data collection system.*
3. *The potential of CEIS for providing feedback on performance to peripheral levels has not been exploited. Assessments in Yemen and Kenya revealed that when the national level received district reports and graphs, it never gave feedback to the local level. The chronic lack of systematic feedback from central sources, even with computerized systems, emphasized the need not only to establish feedback mechanisms but also to develop monitoring at the peripheral levels where the information is collected and can be most effectively acted upon.*
4. *The development of CEIS would have been more efficient if the specifications concerning the purpose and the desired output of the program had been written early in the developmental process. An understanding of specifications and concepts is particularly important when several parties, separated by long distances and varying schedules, are involved. The lack of written documentation on the software and on how to operate CEIS impeded development of the program in a number of ways. Development was further delayed by the lack of an experienced programmer on the REACH staff who could have more effectively monitored and guided activities.*
5. *Because few EPI managers have computer experience, they are not able to effectively supervise or utilize computerized information systems. Moreover, most programs are without back-up personnel who are able to operate the system when a trained staff member goes on leave or changes jobs. Furthermore, turnover of trained computer staff is high. Government staff with computer skills usually look for better employment opportunities and are recruited by other programs. In Kenya and Bangladesh, CEIS became inactive for long periods on several occasions because of*

staff changes. Replacement staff had difficulty learning the system, particularly before the availability of a users' manual.

6. *CEIS is a versatile program; however, this versatility results in technically complex programming.* Installing the early versions of the program required on-site assistance by someone with knowledge of computer programming and the CEIS program. Maintenance, such as file management and correcting programming problems which might develop, also required someone with advanced computer experience. The dependency on external technical support for maintaining CEIS was evident in Kenya, where the system was inoperable for several months because of a relatively minor problem. Fortunately, CEIS 5 is easier to install and less prone to programming error. It is now being tested as a public domain software. How successfully it has met the objectives stated above will be measured by WHO and its users over the coming months.

Although CEIS is a very useful product, its development involved a lengthy and complicated process. Developing software requires clear specifications, constant documentation, and a team approach to ensure the perspectives of a programmer, computer users without programming experience, and a technical writer. Individuals and organizations that promote the use of public domain software must not overlook the importance of locally available technical support for installing, using, and maintaining the program.

IV. MONITORING AND SUPERVISION

Besides promoting the use and application of management information software aimed at strengthening national EPI monitoring systems, REACH has also worked in three countries toward strengthening monitoring and supervision at the district and facility levels. In 1991, REACH began working on strengthening PHC systems in Yemen. During the past year, REACH initiated work in Kenya and Nigeria to develop local monitoring, supervision, and disease surveillance.

Yemen

A 1992 assessment in Yemen recommended strengthening management capabilities by integrating EPI with Primary Health Care (PHC) and by developing monitoring, supervision, and surveillance at the local and governorate levels. Subsequently, PHC supervisors in four governorates began routine monitoring of immunization coverage. They apply DPT1 as an indicator of community mobilization, use DPT3 as an indicator for immunization completion and the difference between the two (drop-out) as an indicator of program management. Seeking to institutionalize this approach, the national immunization program has made the use of these indicators a required management task. In addition, the Yemen EPI devised a supervision system for PHC supervisors which utilizes a checklist. The checklist focuses on the critical program tasks and encourages self-appraisal by health staff. A summary of the checklists prepared by the supervisors permits comparison of service quality between facilities and enables supervisors to detect deficiencies and plan corrective action.

Nigeria

In Nigeria a baseline assessment for the USAID/REACH National Urban EPI/Metropolitan Lagos Project underscored the need to improve program management and the quality of service delivery. In response to this finding, a team composed of staff from the Local Government Areas (LGAs), the Federal and State ministries of health, the Combatting Childhood Communicable Disease (CCCD) project, and REACH worked to identify the immunization program information needs at the service point, EPI store, and LGA level. The team then reviewed the existing recording and reporting systems to determine whether information needs were currently being met.

The outcome of this review process was a proposal for strengthening the supervision and monitoring systems at and below the LGA level. Under supervision, the team devised three objective checklists containing the core immunization-related tasks to be performed at a health facility, during service provision, and at the EPI store. These are intended as aids for both health workers and supervisors; items on each checklist are designed to codify standards for work and to stand as indicators of performance for task clusters. To support the introduction and use of the checklists, the team developed a policy and procedure guide for each. The team then devised supervision summaries for the checklists that would produce comparative analysis of facility performance and task clusters which should be used to monitor immunization program management and service quality.

The team also proposed monitoring based on the existing recording and reporting system. At the health facility level, two indicators were chosen for monthly graphing and action -- the relationship of immunization coverage achievement to a set target and the percent of immunizations provided through outreach services. At the LGA level, three indicators were selected for monthly charting and action -- cumulative drop-out (by facility and total), cumulative coverage achievement, and report receipt monitoring.

The field testing of these tools and systems is ongoing, and final revision is expected in 1994.

Kenya

REACH and the Kenya Expanded Programme on Immunization (KEPI) approached strengthening monitoring and disease surveillance from both the central, district, and health facility levels. REACH worked with KEPI to strengthen monitoring at the national level by identifying information needs and computerizing the EPI information system. For the district level, in 1992 REACH and KEPI produced a manual for the District Health Management Teams (DHMT) on interpreting the KEPI (CEIS) quarterly report. During the following two months, they developed a facilitators' guide and trained provincial-level trainers to conduct workshops for DHMTs on monitoring and disease surveillance. However, KEPI and the provincial trainers did not initiate the district workshops until May of the following year for political and logistical reasons. At present, three provincial teams and one district team have been trained, and plans are under way to complete the provincial-level training.

As a part the A.I.D. Measles Initiative (MI) in two districts of Kenya with low measles coverage, REACH and the Ministry of Health chose to concentrate on reducing high drop-out rates. To measure the progress on drop-out and to promote awareness of drop-out rates in health facilities,

REACH introduced a wall chart for monitoring drop-out rates in the two MI districts. This inexpensive and easy-to-use aid serves as a visual reminder of the cumulative drop-out rate trend in a health facility. Using the immunization data routinely collected by the facility, the chart guides health workers to calculate the monthly drop-out rate, displays the rate on a bar chart, and also provides a record of the EPI target diseases seen at the facility. Owing to the difficulties of monitoring immunization coverage without reliable population data on catchment areas, this approach allows a facility to gauge its performance with information readily available. The chart also serves as a supervisory tool, as the DHMT can quickly determine the immunization performance of the facility by reviewing and discussing the chart with the health staff.

Work in Kenya on health facility monitoring underscored the importance of assisting health workers with defining their catchment areas, especially in terms of target populations. To develop a guide on defining catchment areas, REACH conducted field research on health facility practices in the MI districts. This field work revealed techniques for assessing the accuracy of a health facility catchment area population utilizing immunization data and patient registers.

Discussion

In Nigeria, local health officials have displayed a keen interest in implementing the monitoring and supervision system which they designed. Despite distractions caused by the country's civil unrest, health officials continue to work toward activating their system.

In Kenya, three months after introducing the drop-out rate monitoring chart in two districts through training workshops, two thirds of the health facilities assessed were continuing to monitor their drop-out rates by using the draft version of the chart. Considering that there had been no follow-up after training on using the chart, this finding is very encouraging. The experience in Kenya indicates that with fundamental training, an easy-to-use tool, and at least quarterly follow-up, health facility staff will monitor their own activities.

V. CONCLUSIONS

The REACH Project has contributed considerably to strengthening monitoring practices at global, regional, and national levels by providing technical assistance on using and interpreting the EPI software, CEIS and COSAS. Besides enhancing the technical capacity to utilize the software and interpret results, REACH has widely promoted the concept of monitoring the quality of delivery among EPI managers, policy makers, and supporting organizations.

Tools and resources are generally available for improving management information, monitoring, and supervision systems at global, regional, and national levels. To strengthen these systems at district and health facility levels, efforts must also concentrate on promoting the practices of monitoring and supervision at the local level. Effectively introducing and sustaining these practices requires involving health workers at all levels in the design and implementation of their systems, as well as providing them with practical and inexpensive tools for monitoring, and team self-supervision at district and health facility levels. The lack of reliable population data and routine supervision of health facilities demands the use of facility-level data and simple monitoring techniques which can

be routinely used with minimal dependence on higher levels for materials and interpretations of the findings.

-5-

**WORKSHOP ON CONTROL
OF ACUTE RESPIRATORY
INFECTIONS**

**Held in conjunction with the
National Council for International Health Conference
Arlington, Virginia, USA
June 20, 1993**

**The Resources for Child Health (REACH) Project
John Snow, Inc.
1616 N. Fort Myer Drive, Suite 1100
Arlington, VA 22209**

A.I.D. Contract No.: DPE-5982-Z-00-9034-00



CONTENTS

Acknowledgements	1
Introduction	2
I. Opening Remarks	
<i>Richard Moore</i> , REACH	3
<i>Robert Clay</i> , Office of Health, U.S. Agency for International Development	3
II. Technical Presentations on Control of Acute Respiratory Infections	
"Worldwide Status of ARI Control Programs." <i>David Robinson</i> , World Health Organization	4
"Technical Basis of ARI Standard Case Management." <i>Beth Rivin</i> , REACH	5
"Role of Prevention in ARI." <i>Robert Weierbach</i> , REACH	7
"Steps in ARI Program Development." <i>René Salgado</i> , REACH	9
III. Country Presentations	
"Haiti: Background." <i>Luca Spinelli-Barrile</i> , REACH/Haiti	11
"ARI Materials Development." <i>Lee Ann Smith</i> , REACH/Haiti	11
"Communications: Introduction." <i>Luca Spinelli-Barrile</i> , REACH/Haiti	13
"Communication Component." <i>Elsie Lauredent</i> , INHSAC/Haiti	13
"Bolivia: Study of Physicians' Practices." <i>Victor Lara</i> , Consultant	14
"Nepal: Supervision of an ARI Control Program." <i>D.M. Suwal</i> , Center for Rural Upliftment	15
IV. Available Support for ARI Programs	
"U.S. Agency for International Development." <i>Murray Trostle</i> , U.S. Agency for International Development	17
"World Health Organization." <i>David Robinson</i> , World Health Organization	17
Workshop Program	
List of Participants	
Summary of Participants' Evaluation	

ACKNOWLEDGEMENTS

The Resources for Child Health (REACH) Project would like to express its gratitude to:

- The U.S. Agency for International Development, for funding and participating in this workshop;
- The World Health Organization, for participating in the workshop and providing copies of numerous manuals, studies, and other documents to participants;
- The National Council for International Health, for allowing REACH to hold the workshop in conjunction with the NCIH Conference and for publicizing the workshop; and
- The workshop participants, who represented numerous disciplines, organizations, countries, and nationalities.

INTRODUCTION

Acute respiratory infections, primarily in the form of pneumonia, are rapidly becoming the major cause of childhood deaths in developing countries. Over the past decade, a method for preventing pneumonia from killing children has been developed and has proved to be effective in several field projects. However, although efficacious, standard case management (early diagnosis and treatment with an appropriate antibiotic), is by no means an easy intervention to establish. Major challenges exist both in establishing an appropriate demand for the service and in providing effective services.

On June 20, 1993, the REACH Project held a workshop on the control of acute respiratory infections (ARI) in developing countries. The meeting, attended by some 50 participants, took place at the Hyatt Regency Hotel in Arlington, Virginia in conjunction with the 20th Annual International Health Conference of the National Council for International Health.

The purpose of the workshop was to assist public and nongovernmental organizations implementing or considering ARI control activities, through the provision of up-to-date technical information, country experiences and lessons learned, and resources to support program implementation. Training and technical materials in English, French, and Spanish, many provided by the World Health Organization, were made available to participants.

This report summarizes the workshop presentations. REACH wishes to thank those persons who took the time to attend, particularly the presenters. Learning from what others have done in the field was the essential purpose of this workshop. REACH hopes that you find this report interesting and useful.

I. OPENING REMARKS

Richard Moore, Director, REACH

The Resources for Child Health (REACH) Project is a global project of the U.S. Agency for International Development (A.I.D.) committed to improving child health by providing technical assistance in immunization and acute respiratory infections (ARI) programs. John Snow, Incorporated is REACH's primary implementing agency. Additional technical assistance is provided by the Program for Appropriate Technology in Health (PATH), The Johns Hopkins University, and The Manoff Group, Incorporated.

REACH has worked intensively to help expand and improve ARI control programs in Haiti, Morocco, the Philippines, Bolivia and Nepal. Short-term technical assistance has been provided in El Salvador, Guatemala and a number of other countries.

This is the second ARI meeting organized by REACH and funded by A.I.D. The first meeting, held in July 1991, provided an overview of activities being carried out by various cooperating agencies and donors. This workshop, which comes toward the end of the REACH Project, is designed to share REACH's experiences and lessons learned worldwide. It will serve as a venue for expanding the network of potential partners in establishing or improving ARI control activities.

Robert Clay, Office of Health, U.S. Agency for International Development

Over the past decade, child survival has made a number of remarkable achievements. These documented advances have been the topic of discussions about A.I.D.'s future under the new administration. It is expected that A.I.D. will undergo some changes, such as a tightening and focusing of programs and a shift in countries, but health and population activities will continue to play a particularly prominent role. ARI activities are expected to continue under REACH's follow-on project, BASICS.

The extent of ARI's detrimental impact on the world's children was brought to the forefront during the International Consultation on the Control of Acute Respiratory Infections Conference in December 1991. ARI has now replaced diarrheal diseases as the leading killer of children. Many countries are now implementing programs, and donor agencies are providing technical assistance in the development of programs around the globe.

There are two key challenges to ARI programs. The first is to integrate ARI services with other primary health services. Donor agencies, multilateral organizations and host country governments are all moving toward integrating vertical programs such as the Expanded Programme on Immunization. WHO is developing the "sick child" algorithm, and UNICEF is working on the "well child" program that may include the Expanded Programme on Immunization. As a result of shrinking health budgets, ministries of health are looking at ways to integrate and consolidate programs. The time has come to focus on support services, such as management, supervision and logistics, that will ultimately increase the sustainability of health care services.

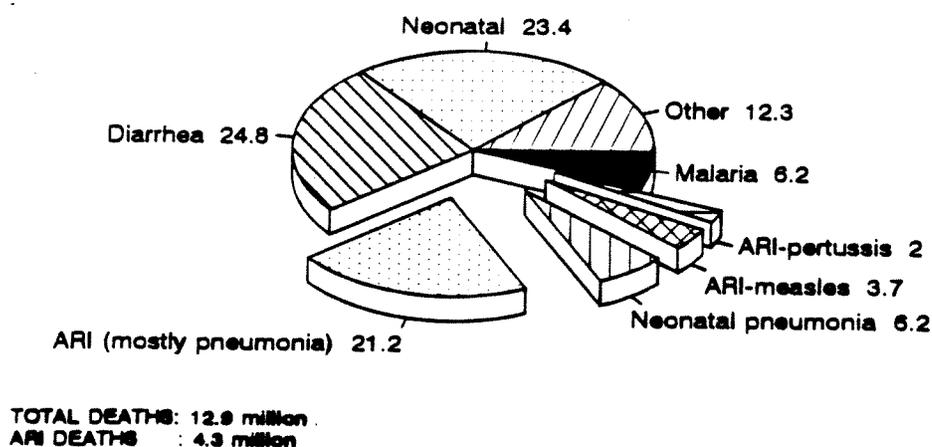
The second challenge to ARI programs is to develop a referral system. Meeting this challenge will require a serious look at how health is being delivered in the clinics.

II. TECHNICAL PRESENTATIONS ON CONTROL OF ACUTE RESPIRATORY INFECTIONS

Worldwide Status of ARI Control Programs, *David Robinson, Medical Office, WHO*

While the global child-mortality rate has fallen over the past 20 years, ARI-related deaths have not declined. ARI is now the leading cause of death for children under five years of age in the developing world, accounting for 30 percent of all such deaths (4.3 of 12.9 million).

CAUSES OF DEATH OF CHILDREN UNDER 5 IN DEVELOPING COUNTRIES, 1990 (%)



About eighty percent of ARI deaths are caused by pneumonia, the disease that is the prime focus of ARI control efforts. Universal immunization against measles and pertussis could probably prevent 10 percent of ARI deaths, and some deaths could be prevented through improved nutrition, action to reduce low birth weight and, eventually, the use of specific vaccines against H. Influenzae type b and the Pneumococcus. For the immediate future, however, the introduction of effective standard case management is the central strategy of the ARI program to prevent death in childhood.

The standard case management promoted by WHO makes the identification and treatment of cases relatively simple. The impact of the program, however, depends not only on standard case management being available in the health facilities, but also on children in need being brought for treatment.

In all countries, standard case management can be implemented in the existing health facilities, but the capacity of those facilities does need to be strengthened. This means training and supervision for front-line case management, an effective logistics system so that antibiotics are reliably available at facilities, and good communications to help mothers to recognize possible pneumonia and to encourage them to bring sick children to the clinic without delay.

Although the technical basis for the program is fully established and training materials and operational tools are available, program implementation has a long way to go. Today, there are 67 operational programs worldwide, but there are still 30 countries with high infant mortality rates, where ARI is of particular significance, which do not have ARI programs. In only a dozen countries does the ARI program cover the entire national health system. The rate of implementation is certainly accelerating, but the present global coverage with effective standard case management is far too low.

There are several reasons why some countries have been slow in implementing ARI programs. Perhaps because it is not as visible as diarrhoeal disease or measles, some countries have not yet seen ARI as the priority it is. In some countries, people in authority, particularly doctors, have doubted that such a simple approach can be effective and, in addition, are reluctant to pass the responsibility for treatment to the peripheral health facility and community health worker. Overburdened ministries see the ARI program as one more thing to do--they don't want any new programs.

But despite these constraints, progress is being made. In partnership with UNICEF and, more recently, the NGO community, WHO is working with countries to accelerate ARI control as an essential part of all child survival programs. Priority is being given to those countries with the highest child mortality rates. New programs are being planned and are getting under way, particularly in Africa, and the coverage of established programs is beginning to increase. NGOs can play a valuable role in increasing ARI coverage by implementing standard case management in the facilities they control, by sensitizing and motivating national health authorities, and by working in partnership with them in developing and implementing programs--particularly at the operational, district level.

Progress can be made once governments are convinced that ARI control is an extension of what they are already doing in treating children and that ARI can be fully integrated into the health system and requires few, if any, additional facilities and staff. It is a priority for child survival that demands--and is beginning to receive--commitment at both national and international levels.

Technical Basis for ARI Standard Case Management, *Beth Rivin, Technical Officer, REACH*

ARI accounts for about one-third of all deaths of children under five in developing countries. The great majority of these deaths are caused by pneumonia. Almost one quarter of pneumonia cases in children can be prevented by measles and pertussis vaccines. Vaccines are also being developed to battle the two most common agents of pneumonia in developing countries--*Streptococcus pneumoniae* and *Haemophilus influenzae* type B--but these are still in the

development and testing stage. In the absence of a preventive vaccine, ARI standard case management (SCM) most effectively prevents ARI deaths.

SCM consists of the detection of pneumonia cases and treatment of pneumonia with appropriate antibiotics. Early diagnosis and treatment are the key to preventing pneumonia deaths. In Jumla, Nepal, the average interval between onset of pneumonia symptoms and death was 3.5 days. This interval was even shorter among the youngest infants, who are most at risk of dying from pneumonia. In Jumla, community health workers are effectively using the SCM strategy in a timely manner to save lives.

ARI classification in WHO's SCM is based on the child's age. For children between the ages of two months and five years, there are three categories of disease: severe pneumonia, pneumonia and no pneumonia. For infants under two months old, pneumonia is always considered severe. All severe cases of pneumonia are referred to health facilities.

DIAGNOSIS

If a child has a cough or difficulty breathing, he should be assessed for pneumonia. The key signs for diagnosing pneumonia are rapid breathing and observation of chest indrawing. Using a timer, a health worker counts the respirations of the child. Respiratory rate cutoffs for the diagnosis of pneumonia are:

- 60 breaths per minute: children under 2 months of age
- 50 breaths per minute: children 2 months up to 12 months
- 40 breaths per minute: children 12 months up to 5 years

TREATMENT

Standard case management cannot be implemented without an adequate supply of appropriate antibiotics. The drug of choice is co-trimoxazole, although amoxicillin, ampicillin and procaine penicillin are alternatives. The first three are administered orally; the penicillin is given by intramuscular injection. Only timely treatment with a full course of an appropriate antibiotic will prevent pneumonia deaths.

The final component of the SCM is advising mothers. Mothers must learn to recognize the danger signs of pneumonia and when to seek care. For simple cough or cold, mothers need to be instructed in home care. Mothers with children taking antibiotics need to learn about the administration of antibiotics and follow-up.

WHO's SCM also includes procedures for treating wheezing, sore throat, ear problems, and fever. In the interest of simplifying SCM and focusing on preventing deaths from pneumonia, many national programs have dropped these treatment procedures from the ARI course.

Pneumonia Case Management Guidelines

Clinical sign: Fast breathing in a child under two months or chest indrawing in a child over two months

Diagnosis: Severe pneumonia

Action: Refer urgently to a hospital

Clinical sign: Fast breathing in a child over two months

Diagnosis: Pneumonia

Action: Treat with antibiotics

Clinical sign: Neither fast breathing nor chest indrawing

Diagnosis: Cough or cold

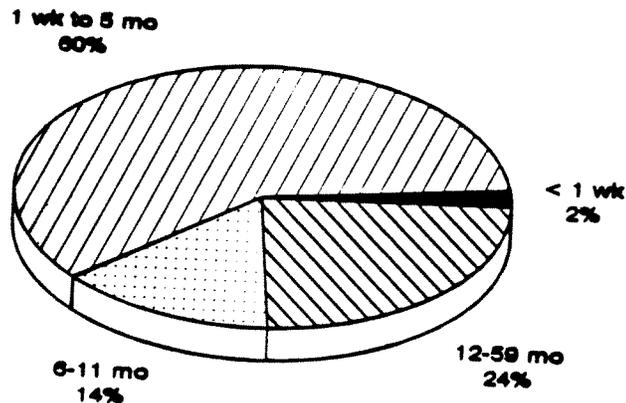
Action: No special treatment required (home care)

Role of Prevention in ARI, Robert Weierbach, ARI Coordinator, REACH

How can ARIs be prevented, and what can programs do to prevent ARI? Knowing the characteristics of ARI and their risk factors is important for implementing ARI programs, but most of the preventive actions should already form part of comprehensive primary health care services.

Based on data from the ARI study carried out in the Jumla district of Nepal, REACH found that 59 percent of the deaths due to ARI were occurring in infants between one week and five months of age. Seventy-three percent of the deaths occurred in infants age one week to one year. Secondly, pneumonia was the leading cause of infant death, accounting for one-third of all deaths. In short, a large portion of pneumonia deaths occurred in very young children.

AGE DISTRIBUTION OF DEATHS DUE TO PNEUMONIA (JUMLA, NEPAL)



Data also showed that deaths occurred very quickly--within four to seven days of onset of pneumonia in Tanzania and in 3.5 days on average in Jumla, Nepal.

Risk factors most strongly associated with ARI are malnutrition and low birth weight. While well-nourished and malnourished children have roughly the same number of ARI episodes annually, only four percent of well-nourished children develop pneumonia as opposed to 46 percent of malnourished children. Low birth weight infants (weighing less than 2500 grams at birth) have a much higher mortality rate than heavier infants. While low birth weight has the greatest impact during the first four weeks of life, the detrimental effects persist throughout the first year.

Other ARI risk factors include poor breastfeeding practices, exposure to chilling, air pollution such as the burning of fuels in homes, parents who smoke, and environmental pollution. The last major risk factor is the colonization with pathogenic bacteria, including *Streptococcus pneumoniae*, *Hemophilus influenzae*, measles or pertussis.

Attacking each risk factor to reduce the number of infants and children at risk of pneumonia will prevent deaths. However, are ARI programs best equipped to conquer these risk factors? Most are more appropriately addressed in other primary health care programs:

Sub-optimal breastfeeding practices. Nutrition programs promote exclusive breastfeeding and the use of colostrum in areas where these practices are not followed.

Pollution. The promotion of efficient stoves for cooking is being implemented in forestry and other development programs, and anti-smoking campaigns may help improve air quality. However, air pollution is not a problem that ARI programs are well suited to attack.

Malnutrition. Nutritional promotion and rehabilitation programs as well as vitamin A supplementation, can reduce mortality overall, and possibly ARI deaths. Growth monitoring promotes early detection of children whose weight is faltering. These interventions are already being carried out through nutrition programs.

Low birth weight. Low birth weight is most effectively prevented by increasing birth intervals and improving maternal nutrition and general health status. Maternal health programs and family planning programs are combatting these risk factors.

Infants exposed to cold. Preventing children from getting a chill may help prevent ARI; however, in many cultures, chills are already considered dangerous, so preventing them may be a difficult practice for ARI programs to promote successfully.

Colonization of bacteria. Theoretically, combatting the colonization of bacteria could be achieved by administering antibiotics prophylactically to any child with even mild ARI. However, each child has an estimated five to eight ARI episodes annually, while only 10 to 20 percent of all children get pneumonia each year. An important study in Indonesia

compared the rates at which children with ARI developed pneumonia in two different populations. One group received antibiotics and supportive care, and the other only received supportive care. The study found that there was virtually no difference in the rates of pneumonia in the two populations.

Incomplete immunization. Vaccinating children against measles and pertussis is an effective way of preventing deaths. Immunization programs are currently making tremendous progress in immunizing children. Also, vaccines are being developed and tested to combat the hemophilus and pneumococcus bacteria that cause most cases of pneumonia in developing countries.

In conclusion, SCM is the most effective intervention in preventing ARI deaths. There is no unique prevention intervention to prevent pneumonia that an ARI program alone can carry out effectively. Nutrition, growth monitoring, family planning, immunization and prenatal care programs all support activities which prevent ARI. These programs and the ARI program are all important parts of a comprehensive primary health care service.

Steps in ARI Program Development, René Salgado, Technical Officer, REACH

Before developing a national ARI program, it is important to determine if there is an ARI problem in that particular country and then to define the country's problem and resources and the possible barriers to a program.

- Is there an ARI problem in the country? Because ARI is a consistently important cause of child mortality across countries, generally speaking, if the infant mortality rate is higher than 40 deaths per 1000 live births, it can be assumed that there is an ARI problem. It is also important to look at regional mortality rates, since only one part of the country may have an ARI problem or may have a more serious problem.
- Are the public and health officials aware of and interested in the problem? Is an ARI program a perceived need? It is hard to promote an ARI program when health officials do not perceive a problem.
- Does the country have access to resources to solve the problem? How can the ARI program be integrated into the health care system?
- Are there any potential barriers for successfully solving the problem? For example, doctors often oppose ARI standard case management because they do not want to lose control.

Step-by-step guidelines on the development of an ARI program are presented in WHO's Program Management Course. Here are several points about the steps of program development that are worth mentioning.

Policy: Gathering information is the first step to developing policy. Eight to ten key people who will be involved in the program should work together to develop the policy. Health workers from all levels of the system should be included in this dialogue. This draft policy should then be distributed to a wider audience for further input. Most importantly, a policy should be dynamic and should be reviewed annually as the program matures.

Training: REACH has found that training doctors in ARI SCM is a highly sensitive subject. Doctors often feel threatened by ARI SCM because they have to relinquish some control of antibiotics to other health workers. SCM trainers of doctors must use a non-threatening style and involve doctors in developing the activity. A simple decision to train nurses before doctors might insult doctors and decrease their cooperation with the program.

Communication: Training health workers to communicate with mothers and other caretakers is one of the more important lessons they can learn. Mothers often simply want to talk, and health workers need to learn how to listen. Specific communications messages should be developed locally.

Monitoring/Supervision: Monitoring the availability of drugs and the number of health workers trained will not indicate program effectiveness. The actual use of SCM needs to be monitored.

Evaluation: The evaluation process should involve the people at the operational level, if possible. Feedback to the workers and their involvement in problem-solving is essential.

Logistics: Timers and antibiotics must be secured and distributed to the facilities where they are needed.

III. COUNTRY PRESENTATIONS

Haiti: Background, Luca Spinelli-Barrile, Coordinator, REACH/Haiti

ARI is responsible for 21 to 60 percent of outpatient visits and for 12 percent of under five deaths in Haiti. Furthermore, pneumonia is perceived by the population as being a serious disease. Yet Haiti lacks a national plan. Through support from A.I.D.'s Humanitarian Assistance Program, REACH is laying the foundation for providing ARI services in Haiti. It is expected that project materials that have been translated and adapted in a REACH-assisted pilot project will be shared with NGOs and the government for use throughout Haiti.

REACH formed a partnership with the local PVO, Haitian Health Foundation (HHF) to develop an ARI program in the coastal city of Jeremie. Although HHF had a good outreach program and monitoring system, with well developed child survival services, it lacked an ARI program.

The two main challenges were to develop an ARI SCM program and to create and channel the demand for ARI services. Structuring service supply included activities such as: ARI training and educational materials development, health worker training, program monitoring and supervision. Creating demand among mothers required designing and executing a communication component. Following are presentations specifically addressing two of the major activities involved in Haiti's ARI control program: development of training materials and the communication component.

ARI Materials Development, Lee Ann Smith, ARI Advisor, REACH/Haiti

One of REACH's objectives was to adapt the WHO ARI standard case management training and educational materials. The materials needed to be in Creole, the local language. And they needed to be culturally appropriate and comprehensible. Some of the activities and lessons learned from the materials development experience in Jeremie are discussed below.

Each translator's vocabulary differs. In the interest of saving time, two translators were hired to translate WHO's manuals into Creole. However, working separately, they translated some of the same words differently, resulting in the need for another person to edit the manual. In the end, the translation was extremely time-consuming.

Training techniques must be culturally appropriate. The self-teaching technique for the supervisors training recommended by WHO was not appropriate in the Haitian setting because Haitians are accustomed to learning by rote. Therefore, the training technique was adapted to have participants read the guide together out loud in a group setting.

The wall chart must be usable. To ensure usability by health workers, WHO's wall chart has been revised numerous times and continues to evolve.

Algorithms or flowcharts can be a totally foreign concept. Recognizing this, REACH drafted and tested a number alternative designs. REACH found that adding "if yes" and "if no" to the wall chart arrows clarified the alternative sequences of SCM steps.

FICH TEKNIK POU TI BEBE KI POKO GEN DE MWA YO
KI GEN TOUS *oubyen* KI MAL POU RESPIRE

Chèche konnen si ti bebe a poko gen de mwa epi si li ap touse oubyen si li mal pou respire

Konte konbyen fwa pa minit ti bebe a respire. Si-l respire 60 fwa pa minit, oubyen pliske sa rekonte ankò



ESKE TI BEBE A GENYEN SIN-N DANJE YO?

- Li sispann tete byen
- Li fè kriz (konvilsyon)
- Li kagou oubyen mal pou leve
- Li gen fyèv oubyen kò frèt

SI
NON

ESKE ANBA KOT LI AP ANTRE ANPIL? OUBYEN ESKE LI RESPIRE VIT?
(Sa vle di, 60 fwa oubyen plis, tou le de fwa lè-w te kontwole-l deja a)

SI
NON

SI WI

SI WI

MALADI KI GRAV ANPIL

- Fè referans san pèdi tan
- Kenbe-l cho
- Ba-l premye doz Cotrimoxazole

NEMONI KI GRAV

- Fè referans san pèdi tan
- Kenbe-l cho
- Ba-l premye doz Cotrimoxazole

PA GEN NEMONI: SE TOUS OUBYEN GRIP

- Aprann paran yo kijan pou yo bay swen lakay

Vocabulary alters the meaning in subtle ways. A vocabulary testing tool was produced using summaries of several different translations of the wall-chart text. Testing of the different vocabularies was conducted with various levels of health workers. The final wall chart incorporated the most familiar and comprehensible language.

User-friendly models of the wall chart increase use. WHO's wall chart was reduced to regular paper size and made more durable to facilitate its use in the field. Plans to laminate the wall chart are still on hold because the wall chart continues to undergo revisions. A protective plastic cover has been furnished as a temporary measure.

Health workers' actions speak louder than words. During role playing, a training technique, health workers demonstrated a reluctance to use the flowchart as a memory aid of all the SCM steps. When asked why, health workers expressed concern that using the flowchart in front of the parents may diminish their credibility. As a result, the ARI reporting form was modified to follow the steps of the flow chart and serve as an alternative memory aid.

Training is essential. The experience in Jeremie underlined the need for solid training. A minimum of four days was necessary, with an emphasis on application, including or followed immediately by clinical practice.

Communications: Introduction, Luca Spinelli Barrile, Coordinator, REACH/Haiti

The second challenge to providing ARI services is creating and channeling community demand through the communications component. A focused ethnographic study was conducted to determine the level of public knowledge of ARI and common local practices and beliefs surrounding pneumonia. The study showed that the public knew a great deal about ARI. ARI, commonly identified by dry cough, chest indrawing and noisy breathing, was seen as potentially fatal. The study also described care practices--home care, traditional practitioners, and professional care.

REACH collaborated with INHSAC, the Haitian Institute of Community Health, an NGO in Haiti.

Communication Component, Elsie Laudent, INHSAC/Haiti

The main objective of the communication component was to communicate ARI danger signs to mothers, encourage them to seek care in a timely manner, and then teach them to properly apply home treatment. These are extremely complex messages to convey to mothers.

The first step in the process of developing a communication component was to analyze the situation. Such a situation analysis tells what words are used, through what channels people communicate, and how people adopt certain behaviors.

The communication plan was designed to focus on interpersonal communication using existing networks. Mass media were ruled out for fear of creating demand beyond the area of project

services. The operational plan included the training of health workers in communication techniques, reinforcement of ongoing activities, integration of ARI messages into current education activities, and presentations at church and school meetings.

ARI messages were communicated through home visits and health rally posts, as well as at mothers' clubs meetings, health committee meetings, and traditional birth attendant meetings. WHO's home-care card was translated and adapted to help mothers remember the ARI messages, and a song written by community health workers helped illiterate parents remember health themes.

Lessons learned include:

- It is essential and rewarding to take time to know your target group, and
- ARI communication activities must be integrated into current health activities to ensure sustainability and a sense of involvement and ownership in the program by community health workers.

Bolivia: Study of Physicians' Practices, Victor Lara, REACH Consultant

The Bolivian Ministry of Health introduced SCM in 1984. In 1990, health care workers were retrained using WHO's revised SCM. Despite these efforts, in the city of Santa Cruz, the Ministry of Health and the private health care organization PROSALUD noted that excessively high usage rates of antibiotics continued to be a major drain on health resources. Hoping to improve pneumonia SCM among physicians and other health personnel, REACH worked with PROSALUD and the Ministry to study current practices of standard case management.

The first step was to identify key well-respected individuals in the local pediatric community to be involved in the study from the beginning. Their participation was promoted to ensure ownership of new interventions by local leaders. Based on input from these individuals, it was decided that the study should take the form of a review of outpatient records.

One thousand outpatient medical records of children with ARI were reviewed. Health care workers were also surveyed. Using the results of this study, the key informants drew three conclusions:

- SCM was not being used. Less than one percent of the records indicated that a respiratory rate was taken.
- Physicians were excessively and inappropriately prescribing antibiotics. The study estimated that if SCM were used correctly, enough money would be saved in one year to cover the cost of appropriate antibiotics for five years.
- The training programs trained the wrong group of health workers. Nurses were trained in SCM but physicians, who were not trained, were treating children with ARI.

These results appeared to have a strong impact on physicians. A seminar at which the study findings were presented generated an overwhelming demand for more pneumonia SCM training. A fixed ARI training center is being established at a government hospital. PROSALUD also plans to set up its own training center and make the use of SCM mandatory at all facilities. Lastly, PROSALUD is adopting this study's method of reviewing medical records as a low cost monitoring tool.

Nepal: Supervision of an ARI Control Program, *D.M. Suwal, Center for Rural Upliftment, Nepal*

Between 1986 and 1989, USAID/Nepal and REACH supported an ARI study in the Jumla district of Nepal to test the effectiveness of community workers in SCM. Community members with no health background and little schooling were recruited and trained in ARI standard case management. Each day the ARI health worker visited 10 to 15 homes, actively seeking and treating cases of pneumonia. Ongoing supervision was an integral part of the initial study and the continuing project to maintain community worker motivation and effectiveness. This presentation outlines some of the experiences and lessons learned in regard to supervision--an element lacking in most primary health care programs.

Supervision can be summed up as follows: "Supervisors and program managers do not directly save lives; their job is to help the field workers to do their jobs more effectively."

The supervisor's job includes the following elements.

- Maintain and improve case management skills among field workers. Pressures from mothers who insist on antibiotic treatment or complain about the health worker can whittle away at a health worker's confidence. Direct, on-site supervision every two weeks maintains skills and confidence.
- Enable field workers to carry out their responsibilities according to plans. The supervisor and health worker develop work plans together, rather than the plan being imposed on the health worker from above.
- Assure adequate stocks and supplies. The supervisor assures an adequate stock of antibiotics. This helps to maintain the credibility of the health worker.
- Assure that the community's needs are being met. Supervisors provide indirect supervision as well, making random home visits to determine the extent to which mothers understand the treatment regimen and messages. The supervisor then provides feedback to the worker.
- Solve problems jointly with field workers. The collaborative process speeds up the resolution of problems and creates a sense of empowerment among health workers.

- Summarize and transmit information to program managers so they can assist in dealing with these issues. Supervisors identify issues that require a higher level of help and discuss them at monthly meetings.

Supervisors collect a minimal amount of data regularly:

- number of pneumonia cases
- number of cases self-referred and actively detected
- amount of antibiotics used

These data are used to track use rates and patterns and plan for future antibiotic needs. They are not put into reports, but rather are discussed at monthly meetings with program managers .

Lessons learned in Jumla include the following:

- Supervision is best accomplished by working in teams of managers, supervisors and workers to increase the quality of care. In Jumla, there was one supervisor for every six to eight health workers.
- All workers must have a clear and shared vision to help prioritize duties and allocate resources.
- Supervision is focused on problem solving and enabling workers to do their jobs, not policing.
- Supervision systems and priorities need to change as programs mature. The supervisor's job is to respond to the changing needs of the population and program.

IV. AVAILABLE SUPPORT FOR ARI PROGRAMS

U.S. Agency for International Development, *Murray Trostle, Office of Health, A.I.D.*

NGOs are critical to the provision of health care throughout the world, especially in the ARI programs. A.I.D. supports these efforts through programs like REACH, which provide technical expertise in program design, implementation and evaluation.

The REACH Project contract expires at the end of September; however, this does not imply any lessening of support for ARI by A.I.D. A follow-on project--BASICS--will link vertical child-survival programs such as ARI, control of diarrheal diseases, immunization, and malaria control. Many cross-cutting issues are common to all of these programs. This project may have small grants available to PVOs for innovative and creative programs in child survival.

NGOs should initiate child survival activities through the USAID missions. Missions will relay their ideas back to A.I.D./Washington through the country backstop officer or the Cognizant Technical Officer in the Office of Health to arrange assistance through a contractor.

World Health Organization, *David Robinson, Medical Officer, WHO*

WHO provides governments with direct hands-on support to develop and implement program plans, improve quality of care, assist in logistics, develop communications, monitor and evaluate. WHO and governments recognize that NGOs provide up to 50 percent of health care in some countries. As a result, WHO is now working with governments to identify local NGO partners in the development of ARI control in child-survival programs. There is a role for NGOs at virtually every level of the system, and WHO is prepared to work with and support them technically as part of the partnership with national health authorities. WHO ARI is attempting to establish closer ties with the NGO community, providing materials and orientation and involving them in planning for national and regional activities. In December 1992, WHO ARI organized a meeting with a number of NGOs working in Subsaharan Africa. Similar meetings are envisaged for other areas during 1993.

Among the materials that WHO can or will be able to make available to NGOs are:

- A variety of training materials for ARI programs, including the basic four-day clinical course which is suitable for most levels of workers. Materials have been designed for community health workers and their supervisors and trainers. These are now being adapted for local use and tried out by an NGO. Other training material is under development.
- Protocols for focused ethnographic studies, health-facility surveys, and household surveys.
- A package of advisory and training materials for the integrated management of the sick child in first-level health facilities. This is being prepared in response to the needs of countries and brings together the management of ARI, diarrhoeal diseases, malaria, measles and malnutrition.

- Technical review papers on a broad range of topics, including oxygen therapy, cough and cold remedies, bronchodilators and the crossover between malaria and ARI.

The WHO program has a strong research element which is supported under the following headings:

Clinical research, including studies of clinical and microbiological aspects of ARI in young infants, and the use of vitamin A supplementation;

Behavioral research, including studies of maternal response to messages and the development of tools for ethnographic studies;

Health systems research, including development of methodology for the surveillance of antibiotic resistance and ways of administering oxygen; and

Research on prevention, which is exploring a wide range of possible options for the prevention of ARI, including the use of vaccines and reduction of indoor air pollution.

The results of the research program feed directly into the implementation of control programs and can be made available for the benefit of NGOs working in the field of ARI control.

A.I.D./REACH ARI WORKSHOP PROGRAM
JUNE 20, 1993
NCIH Conference

- 8:30-9:00 **Registration**
- 9:00-9:10 **Welcome**
. . . . Richard Moore, REACH
. . . . Robert Clay, A.I.D. Office of Health
- 9:10-10:00 **Technical Basis (Moderator, Nils Daulaire)**
. . . . Status Worldwide, David Robinson, WHO
. . . . Technical Basis for ARI SCM, Beth Rivin, REACH
. . . . Role of Prevention in ARI, Robert Weierbach, REACH
- 10:00-10:30 **Question and Answer Session**
- 10:30-10:45 **Break**
- 10:45-11:00 **Presentation of Steps in ARI Program Development (Moderator, . . .**
. . . . Robert Weierbach)
. . . . René Salgado, REACH
- 11:00-11:45 **Country Presentations: Haiti**
. . . . Background Luca Spinelli Barrile, REACH/Haiti
. . . . ARI Materials Development Lee Ann Smith, REACH/Haiti
. . . . Communications Luca Spinelli Barrile, REACH/Haiti
. Elsie Lauredent, INHSAC/Haiti
- 11:45-12:00 **Question and Answer Session**
- 12:00-1:00 **Lunch (Buffet will be provided and discussions will continue during the lunch)**
- 1:00-2:00 **Country Presentations: (Moderator, René Salgado, REACH)**
. . . . Bolivia Victor Lara
. . . . Nepal D. M. Suwal
- 2:00-2:45 **Panel of Workshop Presenters for Discussion, Questions and Answers**
- 2:45-3:00 **Break**
- 3:00-3:30 **Available Support for ARI Programs**
. . . . WHO David Robinson
. . . . USAID Support Murray Trostle
- 3:30-4:00 **Wrap-up (Weierbach, Daulaire, Salgado, Robinson)**

LIST OF PARTICIPANTS
(Alphabetical order by organization)

<u>Organization</u>	<u>Name</u>
ADRA	Jerald Whitehouse
Applied Diarrheal Disease Research Project	Richard Cash
A.I.D., Asia Bureau	Carol Rice
A.I.D., Office of Health	Robert Clay
A.I.D., Office of Health	James Shepperd
A.I.D., Office of Health	Murray Trostle
A.I.D., Office of Health	Nancy Williamson
Andean Rural Health Care	Henry Perry
Association de Sante Publique d'Haiti (ASPHA)	Frantz Simeon
CARE/Nepal	Philip Dayal
College of Medicine, Idi-Araba, Lagos, Nigeria	Ebun Ekunwe
Cornell Univ., South Asia Program	Sabu George
Dartmouth College	Mary Taylor
Federal University of Rio de Janeiro	Antonio Cunha
INHSAC/Haiti	Jean-Robert Brutus
INHSAC/Haiti	Elsie Lauredent
ISTI	Diaa Hammamy
ISTI	Marcia Rock
Johns Hopkins University, School of Public Health	Steven Wiersma
Johns Hopkins University, School of Public Health	Eric Starbuck
Nepal Child Survival & Family Planning Project	Penny Dawson
Nepal Hill Area Development Fund	D.M. Suwal
New York Dept. of Health	Zeil Rosenberg
PATH	Amie Bishop
PVO Child Survival Support Program/JHU	William Weiss
PVO Child Survival Support Program/JHU	Sk. Md. Aminul Islam
Project Hope/Nicaragua	Hugo Barquero
Project Hope/Honduras	Carol Elwin
Project Hope	Marguerite Farrell
Project Hope/Ecuador	Francisco Moreno
Project Hope/Guatemala	Francisco Pineda
Project Hope	Bettina Schwethelm
Queen Margaret College	Patricia Rorsson
REACH Consultant	Heidi Sawyer-Cann
REACH Consultant	Victor Lara
REACH Project/Haiti	Luca Spinelli Barrile
REACH Project/Haiti	Lee Ann Smith
REACH Project	Lori Dandridge
REACH Project	Nils Daulaire
REACH Project	Mike Favin
REACH Project	Dai Hozumi
REACH Project	Rose Macauley
REACH Project	Richard Moore

REACH Project	Surekha Raghavan
REACH Project	Beth Rivin
REACH Project	René Salgado
REACH Project	Lora Shimp
REACH Project	Patricia Taylor
REACH Project	Liz Thomas
REACH Project	Mark Weeks
REACH Project	Bob Weierbach
Salvation Army World Service Office	Faye Hannah
San Diego State University	Nene Diallo
Saniter, Sante Internationale	Alain Lefevre
Save the Children	Katherine Kaye
Save the Children/Honduras	Luis Amendola
USAID/Lima	Susan Brems
WHO/Geneva	David Robinson
World Bank	May Post
World Relief	Muriel Elmer
World Vision Relief & Development	Pamela Kerr

SUMMARY OF PARTICIPANTS' EVALUATION

1. Were the objectives of the workshop adequately met?

- It was an excellent overall presentation of the high points of ARI.
 - Good overview macro and micro aspects of ARI. Raised many more questions which also deserve discussion -- an indication of a good workshop.
 - Good concise coverage.
 - It was very informative and actually quite encouraging that something can really be done about this problem. It showed the considerable progress made in the past decade.
 - A well-balanced day.
 - More or less.
 - Mostly.
- (All other respondents answered "yes" to this question.)

2. Which session was most relevant/helpful to you and your institution?

- Technical review, Bolivia and Nepal presentations -- as provision of appropriate supervision and assessment of case management are very relevant to problems we are now addressing. Available support for ARI programs -- especially WHO presentation/materials.
- It was all good, given time constraints.
- Presentation of steps in ARI program development.
- Role of prevention.
- Global overview for the "lay of the land" re: standards, policies, and statistics. Country-specific presentations for practicality and level of ARI interventions.
- Both the technical review and country profiles were helpful.
- Presentation of steps in ARI program development and available support for ARI programs.
- WHO program support available.

3. Which session was least helpful/relevant and why?

- Technical basis--I guess I already had this information.
- Steps in ARI program development--good but is available in the standard materials.
- Bolivia results were very intriguing, but the beginning of the presentation should have been reduced--it was too long.
- Bolivia presentation and WHO support.

4. What subjects were not covered that you would have liked to have been covered?

- More information on management of ARI in children < 2 months.
- The problems and constraints faced by the MOH (not by REACH, WHO, AID, etc.).
- The issue of helping community health workers administer antibiotics--I recognize that this is an issue that needs more time than you had available.
- ARI in the context of PHC. Although this was referenced as a recommendation for integrity and sustainability, the specifics were not addressed. ARI in terms of agencies and key players involved; specifically, how relevant ARI-related agencies relate to each other and should relate to each other to advance the program as a whole. Finally, a brief history of ARI--for context of effort and current status.
- More detailed discussion about how to obtain financial support in general and in specific areas (research, etc.).
- Need for diagnosis (i.e., rapid, cheap tests to detect bacteria).
- It basically met my need for more information. I was disappointed that AIDS was not mentioned and that ARI people aren't yet thinking so much about how to fit into "sick child" initiative.
- Some more discussion of policy development and the move from NGO/pilot projects to larger-scale MOH/national programs.
- Community response to ARI intervention and community involvement with ARI programs, community role in supervision of workers.
- More country experiences; first review session was not so necessary.

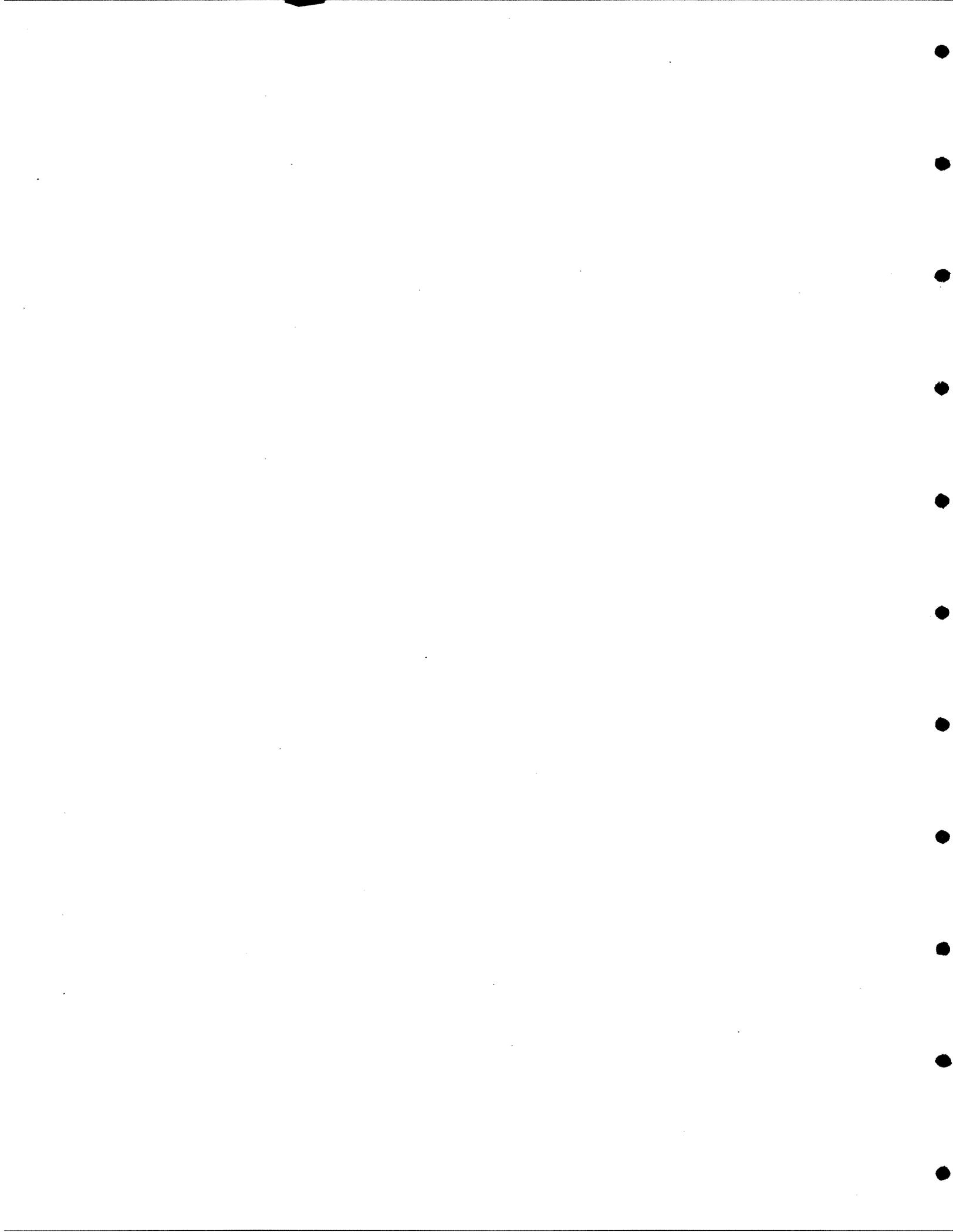
**THE CHILDREN
OF JUMLA, NEPAL**

**Reduction of Child Deaths and Pneumonia Cases
through Pneumonia Case Management
and Vitamin A Supplementation
at the Community Level**

**Nils M.P. Daulaire, M.D., M.P.H.
REACH Senior ARI Technical Advisor
and Principal Investigator,
Jumla Community Health Project**

**Resources for Child Health Project
John Snow, Inc.,
1616 North Fort Myer Drive, 11th Floor
Arlington, VA 22209 USA**

USAID Contract No.: DPE-5982-Z-9034-00



ACKNOWLEDGEMENTS

This paper describes the first four years of a project in which I was intimately involved from 1986 to 1993. Nothing described here could have been accomplished, or even started, without the dedicated involvement of dozens of other individuals. The research agenda that initially triggered these efforts was actively promoted by Prof. Mrigendra Raj Pandey, who became my Co-Principal Investigator, close colleague and friend; without his able intercession with the Nepal Ministry of Health, this project might have gotten started or been able to continue.

Dr. Pandey's staff at the Mrigendra Medical Trust (MMT) have provided valuable support during the three phases through which this project has gone to date: the Jumla Acute Respiratory Intervention Trial, the Jumla Focused Interventions for Child Survival Project, and the current Jumla Community Health Project. In addition to the Kathmandu-based staff of MMT, particular appreciation is due to the Jumla-based staff of the several organizations which have been directly involved in service delivery and data collection (MMT, the Karnali Technical School, and the Nepal Red Cross Society), most notably, Mr. D.M. Suwal, Mr. D.S. Adhikari, Mr. B.R.S. Thapa, Mr. L.S. Buda, Ms. N. McGaughey, and Mr. J. R. Acharya.

Technical assistance has been provided to this project from John Snow, Inc., the REACH Project, INTERCEPT, and Dartmouth Medical School. Special appreciation is due to Ms. Mary Taylor, who served for many years as Project Manager, and who has now become the project's Principal Investigator, and for the three expatriate field advisors who have served successively in Jumla under these projects, Mr. Eric Starbuck, Mr. Damian Jones, and Ms. Kim Allen.

This project was initiated under the USAID/Nepal Integrated Rural Health and Family Planning Services Project under contract No. ASB-0135-C-00-1042-00. Additional financial assistance has been provided by UNICEF/Nepal, and assistance with data analysis provided by the World Health organization, CDR Division. Funding was also provided through the REACH Project under a contract with USAID, Office of Health, with additional support from the Asia/Neat East Bureau. Most recently, financial support for program services has come through a grant from USAID/Nepal to Dartmouth Medical School.

I. OVERVIEW

The Resources for Child Health (REACH) Project has documented dramatic declines in deaths and in pneumonia cases among the children of Jumla District in western Nepal, one of the poorest areas in the world. These declines are the direct result of two Child Survival interventions which have been carried out at the community level by trained villagers over the course of several years:

- detection of pneumonia cases and their treatment with oral antibiotics (*pneumonia case management*); and
- routine periodic dosing of all children with vitamin A capsules (*vitamin A supplementation*).

These services are readily replicated, and their striking effects on child health and survival are directly relevant to community health programs throughout the world, particularly those carried out by grassroots organizations and non-governmental organizations.

This report describes these services in detail so that other groups can benefit from Jumla's experience.

II. SETTING

Jumla is one of the most remote and inaccessible districts in Nepal, cradled between high Himalayan peaks on three sides and an impassable river on the fourth. A five-day walk is required to reach the nearest road; the only alternative means of entering the district is by small twin-engine plane which uses a short dirt airstrip at the outskirts of the district's small administrative center.

Travel throughout the area is possible only by foot, and it takes more than two days to walk from one end of the district to the other, crossing passes of over 12,000 feet. Even the valley bottoms lie above 7,000 feet. Because of Jumla's altitude and its location directly adjacent to mountain peaks rising to more than 20,000 feet, winters are cold and long, and the growing season is short.

These surrounding mountains block much of the monsoon rainfall on which Nepali farmers depend, making the area dry. Yet, because of its isolation and terrain, food cannot readily be imported. Most of the district's 80,000 inhabitants therefore devote their lives to growing meager crops in the steep rocky soil in order to survive.

Not surprisingly, Jumla is an area of chronic food shortage with high levels of malnutrition, particularly among women and children. This situation is particularly severe each year in late spring and early summer, when the previous year's food stocks are depleted and the new crops have not yet been harvested.

Little has changed in the lives of the villagers of Jumla since the settlement of this remote area by Hindu refugees fleeing the Mogul invasion of India more than 700 years ago. Poverty is universal, and the average annual income less than \$75. Barely one in three men and one in twenty women can read or write.

Human and animal labor predominate, and machinery is virtually non-existent. Women have a particularly high burden: they generally devote 14 to 16 hours a day working in the fields, collecting firewood and forage from the forests, and preparing meals. Their social status is extremely low in comparison to men, and they have little economic power. By tradition, they must sleep outside the house with the domestic animals during their menses -- even in mid-winter -- to avoid ritual pollution of their husbands and households.

People live in small, tightly clustered villages consisting of long flat-roofed mud and stone houses, snuggled together on steep hillsides to preserve the precious valley bottoms for farming. Domestic animals are quartered in the ground level of these houses. Most clothing and household implements are homespun and handmade. Radios, flashlights, and even watches are rare luxuries.

Only the administrative center and a few small villages are served by electricity, which is generated by some recently installed micro-hydro plants. In the rest of the district, all heat, illumination and cooking are by firewood. The wood which is used is a highly resinous pine which produces a dense oily smoke that fills and impregnates the poorly ventilated and chimneyless houses.

As a consequence of this constant exposure to smoke, the people of Jumla are renowned throughout Nepal for their black clothes and their sooty skin. This extreme level of indoor air pollution and widespread smoking of local tobacco leaf is believed to contribute to high rates of respiratory disease; it is rare to visit a Jumla household in which a majority of the residents are not coughing.

Health Services and Health Conditions

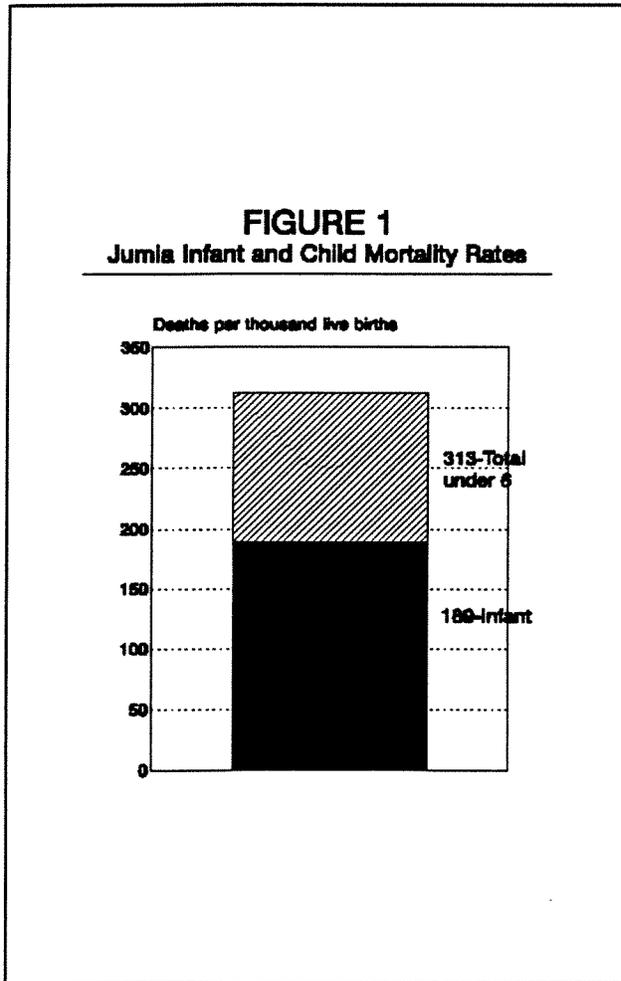
Despite these physical obstacles, a number of Jumla's characteristics made it an appealing site for an intervention study.

First was the absence of other health and social services which could confuse a clear determination of program impact. Jumla's remoteness meant that modern health services were virtually non-existent. At the time the study began, hardly any of the district's population outside the administrative center had effective access to reliable primary health care or simple drugs such as antibiotics.

Immunization coverage was also very low, since outreach efforts of the national Expanded Program on Immunization were severely hampered by Jumla's terrain. Measles immunization coverage was found to be under 15 percent during the years of this study, despite widespread public awareness of the devastating effect of the measles epidemics that periodically swept through Jumla's villages.

This lack of other services made it possible to determine the effect of various program interventions without having to disentangle these effects from those of other ongoing health or development activities.

Jumla's extraordinarily high levels of childhood mortality and illness also made it potentially easier to recognize and to confirm rigorously and statistically any changes that might result from these services. At the start of this program, nearly one of every five children born did not survive through the first year of life, and nearly one of three did not survive to age five (see Figure 1); pneumonia and diarrhea were the leading causes of child death. With such high baseline levels, proportional changes that might be missed elsewhere would be readily discernable.



Given Jumla's poverty, climate and isolation, it was not surprising that levels of childhood malnutrition were also very high. More than a quarter of all newborns were low birthweight, and a similar proportion of children between one and five years old were found to be severely malnourished by armband measure.

Although breastfeeding was universal and bottle feeding was unheard of, breastfeeding did not begin until several days after birth, because colostrum was discarded due to cultural beliefs. Furthermore, mothers' extensive agricultural responsibilities meant that they were often separated from their infants from early morning to late afternoon, making frequent feeding impossible.

Maternal health was also found to be poor. Most women were married in their mid-teens and could expect to bear seven or more children over the next thirty years. Modern family planning was virtually nonexistent. Pregnancy risks were very high, with greater than one percent of all pregnancies resulting in the death of the mother. In conjunction with Jumla's high fertility, this meant that nearly one of every 12 women would not survive their childbearing years.

III. PROGRAM SERVICES AND IMPACT ASSESSMENT

In the face of these daunting statistics, and given the limitations of resources available for Jumla, the project adopted a phased approach. This approach was aimed at developing and testing strategies for low-cost and potentially high-impact services that could be sequentially added, each on top of the last.

The program's commitment to affordable and potentially sustainable interventions could only be carried out using local villagers as health service delivery workers. It was recognized from the start that many well-intended community health programs have foundered because workers have been overwhelmed with too many activities to be digested and properly conducted all at once; therefore, the Jumla workers would be trained to master the necessary tasks one limited set at a time. This would also make it possible to measure the mortality effects of individual interventions.

However, some analysts have maintained that in conditions of such high levels of malnutrition and overall mortality and morbidity, any reductions in deaths from one cause are likely to be matched by increases in deaths from other causes ("replacement mortality"), with no net benefit.¹ Therefore, it was critical to look not just at the immediate effect of the program services on specific causes of death, but to focus particularly on their overall and cumulative mortality impact. Thus, *a reduction in total child mortality was defined as the principal desired outcome.*

A major effort was undertaken to document rigorously any mortality effects. Since health staff may feel they have a vested interest in finding positive effects from programs they themselves are responsible for carrying out, reporting bias was eliminated by setting up a separate personnel structure to assess mortality; both field workers and managers responsible for mortality assessment were independent from program service staff. Within the program's health services, reporting requirements were limited to the bare minimum needed for management purposes so that the service elements would be more directly replicable.

During the project's initial four years (1986-1990), the service intervention study was carried out in two distinct phases. The first (1986-1989) focused exclusively on pneumonia detection and treatment. The second (1989-1990) added routine vitamin A supplementation to the ongoing pneumonia services. Following the end of the study component, these services have been maintained up to the present.

¹Mosley WH, Becker S. Demographic models for child survival: implications for program strategy. In: Child survival programs: issues for the 1990's. Institute for International Programs, School of Hygiene and Public Health, The Johns Hopkins University, November 1988.

IV. PNEUMONIA CASE MANAGEMENT

Pneumonia is now the single largest killer of children in the world. The large majority of these children die never having been admitted to hospitals, and most come from households in areas unserved or underserved by trained health professionals or reliable health facilities. Therefore, a key to substantially reducing pneumonia deaths worldwide lies in strategies which do not absolutely require health professionals or inpatient hospital facilities.

Basis for Diagnosis and Treatment

Jumla was one of the earliest large-scale community-based programs to incorporate a new strategy for pneumonia control known as *standard case management*. The scientific basis for this approach, which has been well documented by the World Health Organization,² is now broadly accepted.

Standard case management consists of making a presumptive diagnosis (or "classification") of pneumonia based on a limited set of physical findings -- principally *fast breathing* or the observed presence of *chest indrawing*. Stethoscopes, chest X-rays, and other "high tech" and professional-intensive approaches are not required.

Studies have found that the large majority of serious and fatal pneumonias in the Developing World are caused by limited types of bacteria which are highly sensitive to a variety of low-cost antibiotics. This has meant that specific identification of the particular organism responsible for the infection is not necessary in the large majority of cases.

Therefore, children classified as having pneumonia are then treated over a five-day period with one of these antibiotics without need for further testing. Where possible, seriously ill children (again following standard definitions) are referred for hospitalization.

In Jumla, the WHO protocols were simplified even further. This was necessary to accommodate the realities of barely literate village health workers operating without the benefit of referral facilities, hospitals, or physician back-up.

The project decided to concentrate exclusively on pneumonia, as this accounts for virtually all deaths due to acute respiratory infections. No effort was devoted to household treatment of coughs and colds, since there is no evidence that this treatment or the lack thereof has any effect whatever on mortality or development of serious illness.

²World Health Organization. The management of acute respiratory infections in children in developing countries. Document WHO/RSD/85.15.1985. Geneva: World Health Organization, 1985.

For all ages between birth and five years, a single cutoff rate of 50 breaths per minute or more was adopted as the basis for classifying a child with cough as having pneumonia.³ The use of a single rate greatly simplified health worker training and reduced the likelihood of confusion and misclassification among health workers.

Recently, WHO has adopted a simplified recommendation for standard case management by community workers. This approach uses two breathing rates: 60 under 2 months and 50 above that age. As of 1993, the Jumla program began the process of adopting this approach. However, the results described here reflect the program's experience using only one single cutoff rate of 50 for all age groups.

Measurement of Breathing Rates

The measurement of breathing rate was initially problematic among Jumla's community workers, since none had watches or other objective means of determining when a minute had elapsed. As a first step, an effort was made to teach these workers to make a subjective determination of fast breathing, but despite considerable training efforts, this approach was found to be inadequate.

Since some objective measure was necessary, sand timers were first tried. Unfortunately, inexpensive sand timers were found to be highly inaccurate and unreliable, while high quality sand timers cost in excess of \$5 a piece and had to be imported from Europe. To deal with this issue, a prototype electronic beeper was developed late in 1986 specifically for the Jumla program.

This Jumla Timer was designed to beep after 30 seconds, since it was found that the difficulty of keeping a child still for a full minute outweighed the slight increase in accuracy which could be gained by a full minute count. The timer provided the added advantage of giving the worker an objective basis for *withholding* treatment, which workers otherwise found difficult in the face of a worried mother. In fact, this strange beeping device soon gained notoriety throughout the district as a supernatural tool capable of judging the cause and severity of a child's cough, and contributed considerably to a rise in the status of the community health workers using them.

The Jumla Timer proved to be such a useful and appropriate use of technology that it was subsequently modified and improved for mass production by WHO and UNICEF and has now been adopted for worldwide use by community health workers involved in pneumonia case management. Its projected unit cost is US \$3.00 to \$4.00.

³This approach followed the WHO recommendation in effect at the time the program began, but differs somewhat from the current WHO policy, which uses a cutoff rate of 60 for children under 2 months, 50 for children between 2 months and one year old, and 40 for children above 12 months. The disadvantage of using only a single rate is that children under 2 months (who naturally breathe more rapidly) might be classified as having pneumonia more often than appropriate, and children over 12 months might, in some instances, have true pneumonia which might not be diagnosed. However, since young infants have the highest risk of pneumonia death and since this risk is much lower among children over one, over-diagnosing the high-risk group and under-diagnosing the low-risk group seemed acceptable, in terms of both overall risks and benefits.

Treatment

All children who met the criteria for pneumonia (i.e., fast breathing or chest indrawing), whatever the level of severity, were treated exclusively with oral antibiotics in their own homes. Referral, inpatient treatment, or treatment with injectable antibiotics was not feasible in the Jumla context and was not attempted.

Field workers were supplied with only one antibiotic, an oral suspension of co-trimoxazole (trimethoprim-sulfamethoxazole), which cost less than \$0.50 per treatment course. Although this was several times more expensive than the cost of treating with co-trimoxazole tablets (which at UNIPAC costs would be approximately \$.07 per treatment course), young children were more willing to accept the flavored syrup than the bitter co-trimoxazole tablets.

Recognizing that antibiotics have to be taken by the child in order to work, the project was willing to accept the extra costs as well as the difficulties of transporting liquids in order to ensure use-effectiveness. Definitive studies on the use and cost-effectiveness of tablets versus syrup have yet to be conducted.

A small plastic bottle just big enough to hold the five day supply of syrup was given to the mother. She was also given an inexpensive, domestically manufactured plastic spoon just big enough to hold one teaspoonful (5 cc), with markings for one half and one quarter this amount visible on the inside; these were the appropriate doses for children over 12 months, 3-11 months, and under 3 months, respectively. Each mother was carefully taught how to feed the syrup to the child, and told the importance of completing the full five days of medicine.

Selection, Training and Deployment of Health Workers

Health workers were selected from their communities by local program managers on the basis of community reputation, willingness and ability to walk regularly to all the houses in their service area, and basic literacy skills for record-keeping. Unfortunately, only a few women were able to meet the last two criteria, so most workers were men. It was acceptable in the cultural context of Jumla for these men to meet with and discuss child health issues with mothers -- which was essential for their effectiveness.

The workers received nine days of small group training which included lectures, demonstrations, role play, and observation of actual cases. In addition to learning how to recognize and treat pneumonia and keep basic records, they were taught how to educate mothers about the danger signs of pneumonia and to encourage them to seek care quickly.

All of Jumla's more than 13,000 children under five were covered by this program. Each health worker visited each of the approximately 160 households in his/her area every two weeks to check any child with a cough and cold and to talk to mothers about danger signs of pneumonia. Home treatment with antibiotics was initiated for all children classified as having pneumonia. The health worker followed up on each sick child after two days and at the end of the treatment course.

In the event that a child failed to respond to co-trimoxazole, oral chloramphenicol was available as a second line antibiotic. To avoid confusion on the part of the health workers and the risk of labelling the latter as a "better" medicine, chloramphenicol was handled only by program supervisors. As it turned out, it was only rarely used and did not appear to play an important part in the program.

Phase-in and Study Period

In order to allow a realistic period to train and deploy 80 health workers and to develop and put in place adequate management and supervisory systems for an entirely new program intervention, pneumonia case management services were phased in throughout the nearly 200 villages and hamlets of the district over the course of the first year. The study was subsequently continued for an additional two years to determine the impact of the program. During this period the *only* services provided were for pneumonia case management. The formal pneumonia study ended in mid 1989.

Mortality Assessment

From the start of the study, a separate data collection system was set up to assess mortality. This impact assessment program carried out complete and detailed registration of each birth and child death in a representative selection of villages comprising nearly two thirds of the district's population.

One person in each village was recruited as an enumerator. He/she was paid a small monthly stipend, with a supplement for each birth or death reported. This incentive system assured that few events were missed (less than 1 percent by subsequent survey), and a supervisory verification system prevented false reporting of events which had not actually occurred.

Supervisors for the vital events registration system visited each village monthly. As part of their verification of the events reported to them by the enumerators, they conducted detailed interviews on each birth and death. Death registration included cause of death determination through a process known as "verbal autopsy," in which parents were interviewed regarding symptoms surrounding the child's death. These symptoms were recorded by the supervisors, and a panel of clinicians subsequently assigned probable cause.

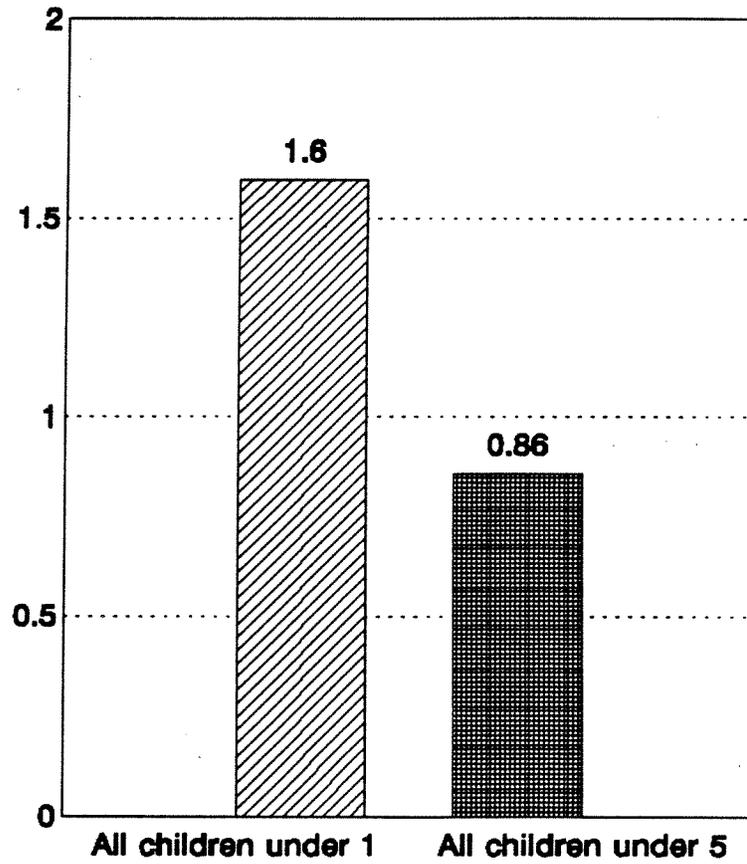
During the three years of the pneumonia study, 2,101 child deaths were documented and cause of death assigned.

Patterns of Pneumonia Illness and Deaths

Based on these classification criteria, pneumonia case rates were found to be very high: each year, there was an average of nearly one case of pneumonia recorded for every child under 5. The first year of life was a particularly high-risk period, with an average of more than one and a half cases recorded per infant per year (see Figure 2). This clearly demonstrated the priority of addressing the under-ones in a pneumonia control program.

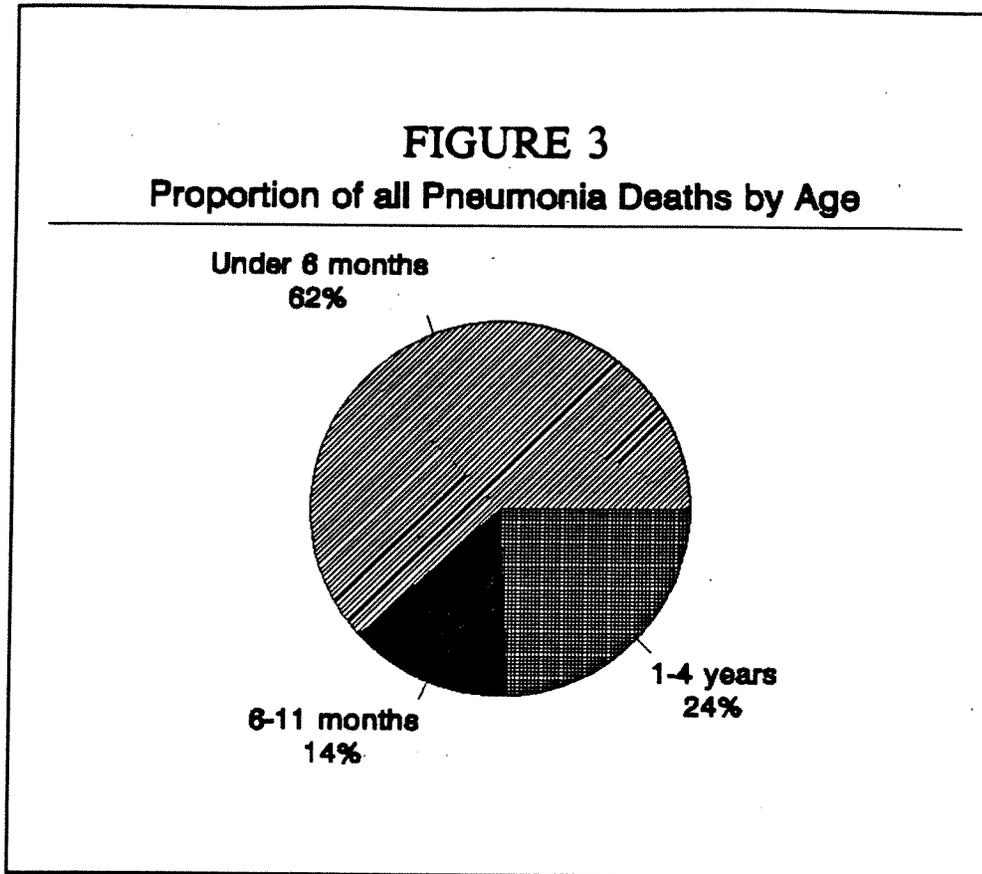
FIGURE 2

Average Number of Cases of Pneumonia per Child per Year



The need to focus on infants was borne out by mortality data which showed that pneumonia was the leading cause of death among infants who survived the first week of life. A detailed examination of these deaths showed that these pneumonia deaths especially predominated in the first six months of life (see Figure 3).

FIGURE 3
Proportion of all Pneumonia Deaths by Age



Starting shortly after six months, the risk of pneumonia death declined progressively. Meanwhile, diarrhea deaths increased dramatically starting at the time of weaning, which begins at six months in Jumla. This is no doubt exacerbated by the young children's increased mobility at this age, and their common practice of mouthing the objects lying around in their very unsanitary household environments.

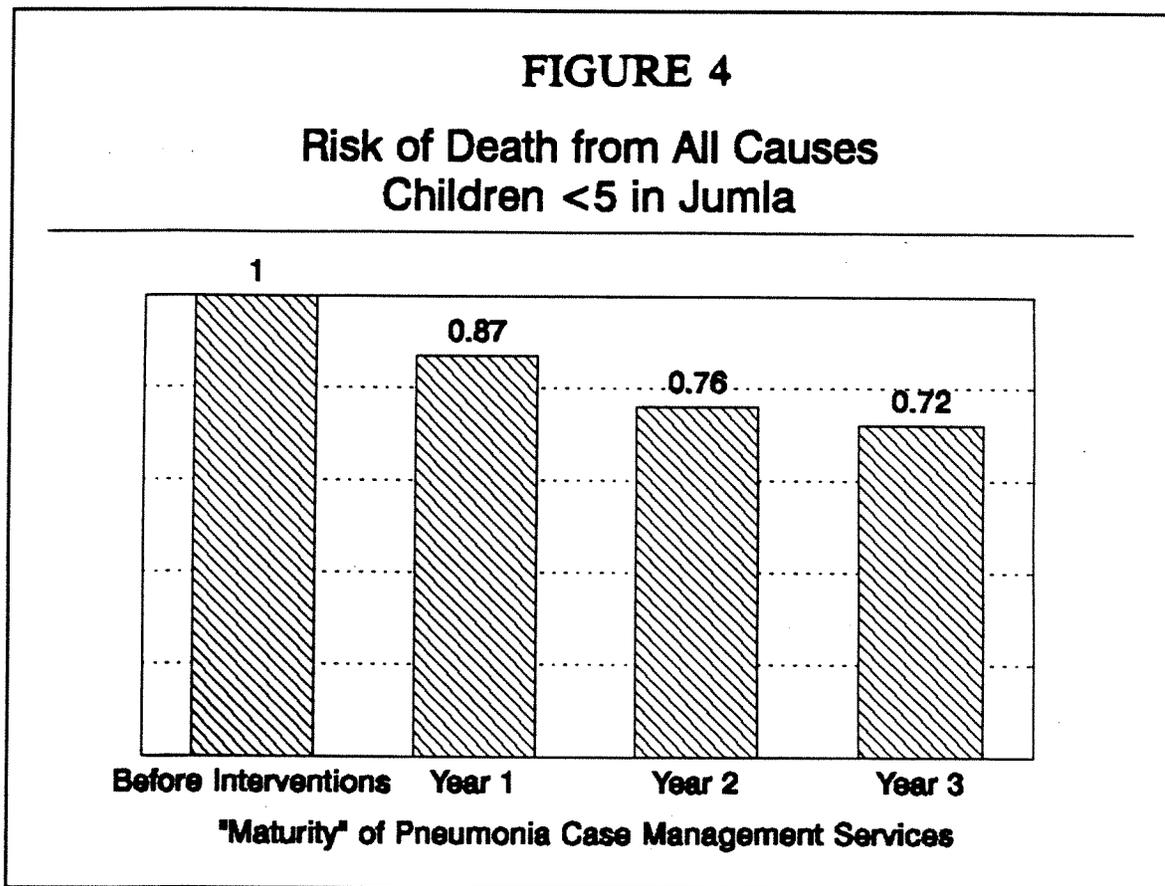
After the first year of life, diarrhea deaths predominated, and pneumonia became a very small part of the mortality of older children. Again, this finding underlined the importance of focusing on the youngest.

A review of deaths attributed to pneumonia highlighted the acute and critical nature of this illness. Based on mothers' histories, it was found that, on the average, children died within three and a half days of the first signs of pneumonia. During their last day of life, most of these children were so sick that they were unable to eat or drink. Among the very youngest, the course was even more rapid.

The fast deterioration of children with fatal pneumonia reinforced the need for rapid action and underlined the importance of *mothers* recognizing and acting on the first signs of pneumonia. Once this had been identified by program managers as a critical element of effective case management, even more emphasis was given to maternal education as part of routine house visiting. The result was that the proportion of pneumonia treatments that were started because of mothers actively seeking help rose from 15% in the first year to 56% by the third year of the program. Mortality reduction directly reflected this increase.

Impact on Mortality

As the goal of the program was reduction in overall child mortality, this, rather than pneumonia-specific mortality, was considered the key outcome, rather than pneumonia-specific mortality. The effect of the pneumonia case management services was progressive and dramatic, reflecting progressive improvements in early case finding and self-referral. *By the third year of services, child deaths were reduced by 28 percent* (see Figure 4).



This large decline was examined statistically and found to be highly significant. It was suitably controlled that it could not be due to simply a temporal trend, nor could it be explained by any other changes in health services or the conditions of life in Jumla aside from this program.

Surprisingly, the decline in mortality was observed not only among pneumonia-specific deaths (which dropped by 30%), but in deaths ascribed to numerous other causes, particularly measles and diarrhea. Since there was no meaningful increase in measles immunization coverage and no significant diarrhea control measures taken during this time, the early treatment of pneumonia (a common end-stage complication of both measles and persistent diarrhea) was the only likely explanation.

Interpretation

It would appear that the pneumonia program's broad impact across several different immediate causes of death was the result not only of lives directly saved by treatment but also of improved health status among the large number of children who received early treatment for pneumonia. It is known that most pneumonia episodes are not directly fatal, even in the absence of antibiotic treatment. However, because each episode is so debilitating, it leaves the child greatly weakened and susceptible to future illnesses of various kinds. Jumla's children, with an average of more than 1 ½ episodes of pneumonia per child in the first year of life, were particularly ravaged by this disease. The added stress of a later episode of pneumonia or measles was all that was necessary to kill them.

With the establishment of pneumonia services, the picture changed radically. Early case detection and self-referral resulted in antibiotic treatment early in the course of the illness for most of Jumla's children. Dramatic improvement was generally seen within one to two days of starting antibiotics.

This program appeared to substantially reduce the overall burden of disease faced by these children. Because they emerged from their illness stronger and healthier than they would otherwise have been, they were in far better shape to handle future illnesses of all sorts, and were, therefore, far less susceptible to death from a variety of causes in addition to pneumonia.

In view of this, pneumonia treatment might well be considered part of a strategy to prevent future illnesses, as well as a direct curative strategy.

Implications

Following its publication in the *Lancet* in 1991,⁴ this study has been widely cited as evidence that the pneumonia standard case management approach can be highly effective in reducing mortality in areas with high pneumonia rates.

⁴Pandey MR, Daulaire NMP, Starbuck ES, Houston RM, and McPherson K. Reduction in total under-five mortality in western Nepal through community-based antimicrobial treatment of pneumonia. *Lancet* 1991; 338: 993-97.

The study has proven that community health workers are fully capable of carrying out standard pneumonia case management, as long as certain programmatic conditions can be met. These conditions include adequate training and supervision (in the case of Jumla's community workers, 9 days of training devoted exclusively to pneumonia, and supervisory visits in the field every two weeks), reliable means to do an objective respiratory count (such as the Jumla Timer or the new UNICEF Timer), and a dependable and timely antibiotic resupply system (since no lives can be saved without medicines). These substantial reductions in deaths can be achieved even in the complete absence of referral facilities and higher level medical staff.

Starting a primary child health care program with pneumonia services turned out to be extremely popular and effective, since people felt immediate and tangible benefits. This reinforced the willingness of community workers to accept and apply the standard case management model. Notably, programs in other settings that have focused on training doctors and nurses have often encountered far more resistance to this approach, as established clinical habits have had to be unlearned.

The cost of this program was not high. In Jumla (where treatment rates, and, therefore, antibiotic needs, were greater than would be found in most other places) the cost per child covered was less than \$4 per year. This cost included salaries for all the community workers, who were paid on a part-time basis, as well as supervisory and management costs; it did not, of course, include the costs associated with the research aspect of the program.

V. VITAMIN A SUPPLEMENTATION

Once the research portion of the pneumonia program was completed in 1989, research attention shifted to other complementary and potentially major sources of child mortality reduction. Periodic mass vitamin A supplementation appeared promising for a variety of reasons.

Research published in 1986 by Sommer and colleagues⁵ indicated that mass vitamin A supplementation might have a direct benefit on reducing childhood deaths in developing countries. By 1989 no additional studies had yet been completed which might confirm or refute this staggering premise, and considerable controversy raged in the scientific community about whether a "magic bullet" in the child survival effort had been discovered.

Regardless of its general mortality impact, benefits of vitamin A in preventing childhood blindness due to xerophthalmia (a devastating deterioration of the eye due to vitamin A deficiency) had been long established. Among the more than 2,000 deaths reviewed in the Jumla pneumonia trial, eye signs suggestive of severe xerophthalmia had often been reported. This suggested that vitamin A deficiency was widespread among these children. This premise was borne out by a survey conducted at the end of the pneumonia trial which found that more than 13 percent of Jumla's children suffered from xerophthalmia -- six times the level considered by the World Health Organization to indicate a serious public health problem.

⁵Sommer A, Tarwotjo I, Djunaedi E, West KP, Loeden AA, Tilden R, *et al.* Impact of vitamin A supplementation on childhood mortality. *Lancet* 1986;1:1169-73.

Since the benefit of vitamin A supplementation on this degree of xerophthalmia were well-established, it was appropriate to proceed with a widescale supplementation program among the children of Jumla. The existing vital events reporting system made it feasible to assess any mortality effects with little additional effort.

Supplementation Program

All children under five throughout Jumla district were targeted to receive high-dose vitamin A capsules. Above 12 months of age, the standard dose was one whole capsule (200,000 IU). Because extraordinarily high rates of xerophthalmia had been found even among children under a year old, all infants were also supplemented. The dosage used was one half capsule for children between 6 and 12 months of age, and one quarter capsule for those under 6 months of age. These smaller doses were administered by snipping the end off a vitamin A capsule and administering a proportional number of drops.

Under circumstances of mild levels of xerophthalmia in a population, supplementation every six months is generally recommended. In severe deficiency areas such as Jumla, supplementation every four months is considered more appropriate,⁶ so this schedule was adopted.

Program Management

Pneumonia program supervisors were taught to administer vitamin A. To avoid confusion and the likelihood of missed or multiple dosing, a village-by-village mass campaign was instituted. The community health workers assisted in assembling all children in a village to be dosed on the same day, and all the villages to be covered in each round received vitamin A capsules over a period of less than two weeks.

This approach was considerably simpler than relying on child registers to target each individual child. As a result, nearly all of Jumla's children were able to receive vitamin A over a short period. This approach also simplified the management tasks of storage and distribution of vitamin A capsules to health workers.

During the four-month interval between campaigns, the capsules were not made available to health workers so there would be no possibility of accidental overdosing, which could potentially result in toxicity.

⁶World Health Organization, UNICEF/International Vitamin A Consultative Group Task Force. *Vitamin A supplements. A guide to their use in the treatment and prevention of vitamin A deficiency and xerophthalmia.* Geneva: WHO, 1988.

Phase-in and Study Period

The pneumonia case management program required more than a year to phase in throughout Jumla district. The vitamin A program was considerably simpler, and the phase-in was planned to be completed throughout the district by the second round of supplementation, i.e., within less than six months.

The first round, during which only part of the district could be fully covered, was used to allow a comparison of communities with and without supplementation for this initial period. Based on data available from the three prior years of vital events collection, communities which received supplementation in the initial round were matched with villages in which earlier child mortality had been nearly identical. This allowed a valid comparison of mortality in supplemented and unsupplemented children.

Mortality Assessment

Vital events registration and cause-of-death determination took place exactly as during the pneumonia study. Only the initial five-month comparison period was used in assessing the mortality effect of vitamin A supplementation, since this was the only period during which there was a matched control.

Impact On Mortality

Mortality in villages which had received supplementation was 26 percent lower than in the villages which had not yet received vitamin A.

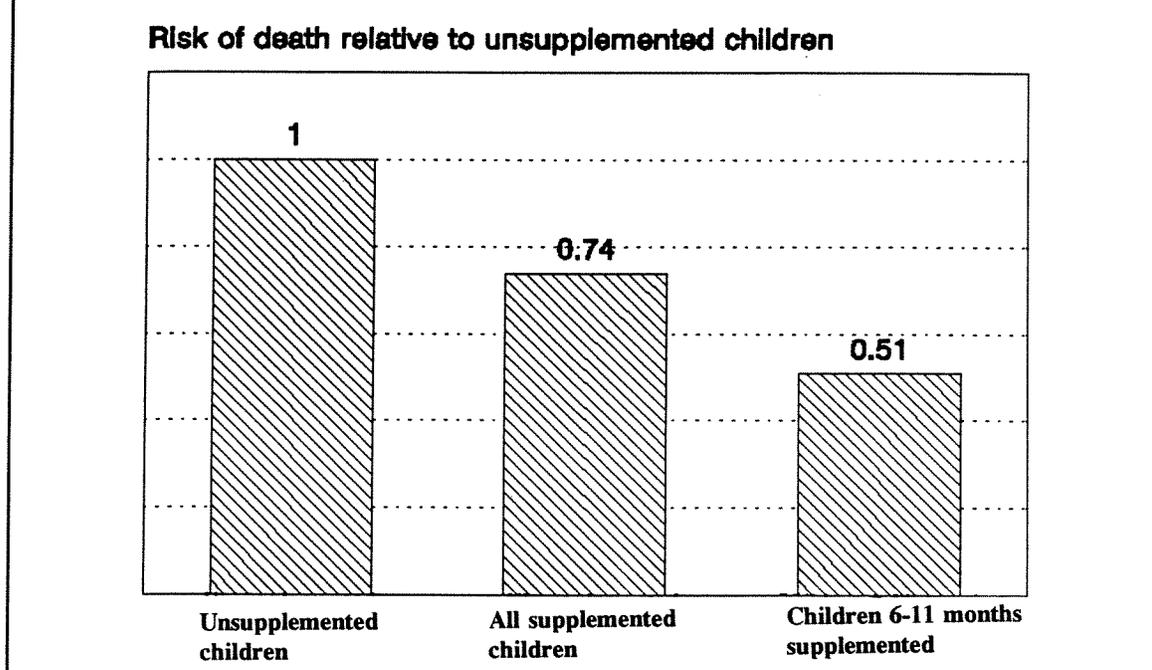
Even though this study only assessed the effects of one single dose of vitamin A over a relatively short period, Jumla's high underlying child mortality rates allowed this dramatic impact to be observed. The reduction was statistically significant and could only be explained by the vitamin A.

The effect was greatest in children between 6 and 12 months, where the risk of death was cut nearly in half, but was also apparent in all older age groups (see Figure 5). Infants under 6 months of age did not appear to benefit from the supplementation, but there was also no indication that these children suffered any substantial problems or complications from receiving vitamin A.

By cause of death, the greatest benefit of vitamin A appeared to be among children dying from diarrhea, where a one third reduction was observed. The risk of pneumonia death showed a much smaller decrease. However, the number of pneumonia deaths was relatively small in the age groups most affected by vitamin A (children between 6 months and 5 years old), and so it was not possible to determine whether this reduction was due to supplementation or simply to chance variation.

FIGURE 5

Protective Effect of Vitamin A



Implications

The benefit of vitamin A supplementation for child survival among the children of Jumla was unmistakable. Following analysis of data from the five-month comparison period (published in the *British Medical Journal*⁷), similar dramatic improvements in survival were noted for the entire child population of Jumla, and the program has continued to date.

Based on this study and several others published since 1989, it is now clear that vitamin A supplementation can have a tremendous effect on reducing child mortality in areas where vitamin A-rich foods are not part of an early childhood diet. Discussion continues as to whether supplementation is best and most sustainable by changes in diet or by capsule distribution.

In Jumla, changing the foods which are grown and given to young children is likely to require many years of intensive and costly educational input because of strong underlying cultural beliefs concerning child feeding. Four years of experience to date has shown that capsule distribution on

⁷Daulaire NMP, Starbuck ES, Houston RM, Church MS, Stukel TA, and Pandey MR. Childhood mortality after a high dose of vitamin A in a high risk population. *BMJ* 1992;304:207-10.

a periodic mass campaign basis can be programmatically sustained within the managerial resources of a community health program.

Furthermore, the total programmatic costs of this effort, at less than \$0.20 per dose, have proven to be affordable. The dramatic impact on mortality in Jumla resulted in an estimated cost of less than \$11 for every life saved, which makes vitamin A capsule supplementation in this setting one of the most cost-effective child survival strategies ever seen.

VI. VITAMIN A AND PNEUMONIA CASE RATES

While a number of studies confirming the life-saving benefits of vitamin A have now been completed and published, few of these have been designed to look also at the effect, if any, on the likelihood of developing pneumonia.

Concerns have even been raised that vitamin A might have some sort of adverse risk on pneumonia, since pneumonia deaths have not shown the type of strong reduction seen in overall mortality and in diarrhea deaths.

The Jumla study offered a rare opportunity to assess whether vitamin A supplementation might have an effect on a child's likelihood of developing pneumonia. Since pneumonia had been the focus of the original research, a substantial baseline was available for comparison purposes. Since pneumonia case detection and treatment continued throughout the vitamin A supplementation program, changes in the likelihood of illness could be assessed.

Morbidity Assessment

This study, based on the same comparison period as the vitamin A mortality study, compared the difference in risk of pneumonia illness between children in supplemented and unsupplemented communities. As part of routine program management, the pneumonia control program had collected biweekly data by village on the number of pneumonia cases which had been detected and treated. Given the continued high coverage of the pneumonia program, this provided an excellent approximation for the actual number of pneumonia cases which were occurring in these villages.

Since the communities which received the initial round of vitamin A capsules had been matched with control communities on the basis of prior mortality rather than pneumonia case rates, this assessment was carried out both on a side-by-side comparison basis and with adjustments for any pre-existing differences which might be found.

Impact on Pneumonia Morbidity

The communities which received early dosing with vitamin A capsules showed a 33% lower rate of pneumonia cases.

This reduction mirrored the reduction which had been observed in total child mortality. Not only were fewer children dying, fewer were getting sick enough with pneumonia to require antibiotic

treatment. Even taking differences in baseline into consideration, the reduction was highly statistically significant and could not be explained by any factor other than the vitamin A supplementation.

Implications

In a population of children with high rates of pneumonia, high mortality, and considerable levels of vitamin A deficiency, it appears from this study that vitamin A supplementation has a direct protective effect on the likelihood of developing pneumonia. As a result, the demand on pneumonia standard case management services and the need for antibiotics may be reduced.

This is the first finding of this effect to be reported⁸ and indicates that vitamin A may be a useful preventive strategy among similar groups. Given the vitamin A's proven benefits on overall child survival, this study makes it even more clear that it has an important place in most community health programs.

VII. AFTERWORD: THE CHILDREN OF JUMLA, 1993

At this writing, the pneumonia case management and vitamin A supplementation services continue throughout Jumla district. The remarkable mortality reductions described here have been sustained and are being further augmented by a set of complementary services directed at the early detection and treatment of childhood diarrheas and the promotion and support of the government's immunization services.

This phased approach to the development of primary health services has proven itself to be both effective and manageable. Despite the wider range of services which they now deliver, Jumla's community health workers have not been overwhelmed by their responsibilities. In fact, they have taken the lead in requesting training to carry out new services, in response to requests from their villages.

Because the very first services which they provided, pneumonia case management, gave such tangible and rapid results, the community workers gained substantial credibility and authority in the villages. This is in marked contrast to programs in which field workers focus initially on health education and prevention, even though these may in fact offer considerable long-term benefits. This is a clear example of the need to understand the psychology of the population to be served as well as their particular public health situation.

The credibility that Jumla's workers gained through pneumonia case management made it possible for them to gain ready acceptance for vitamin A supplementation. Later it made it far easier to introduce oral rehydration, which in many other programs is not readily accepted by families because

⁸Daulaire NMP, Taylor ME, Stukel TA, Starbuck ES, Pandey MR. The effect of vitamin A supplementation on pneumonia morbidity and mortality in children among a highly deficient population. In press, 1993.

it is not a medicine and because it does not cure the most apparent symptoms of diarrhea. Workers have to be believed in order to be effective educators.

The rapid and sustained decrease in child mortality achieved in Jumla has resulted in a broad popular awareness that large family size is no longer necessary. Mothers and community leaders have now begun to request assistance in family planning. Based on these requests, efforts are underway to incorporate these services into Jumla's community health programs.

As these effects have been accomplished by local villagers working with community-based structures and local indigenous organizations, there have been deeply felt changes in empowerment on the part of villagers, particularly women, and a recognition that positive changes are possible, even within the continued severe economic constraints of Jumla.

This approach is fully appropriate for non-governmental organizations and well-managed governmental programs throughout the developing world which take a community-based approach. At a total programmatic cost of less than \$1 per capita per year, it would appear that this model is both appropriate and sustainable, given minimal levels of external or locally generated financial support.

The children of Jumla have benefitted tremendously from these services, and have taught us a great deal about the realities of primary health care. With the continued growth in the array of cost-effective health services delivered through this program and the new establishment of family planning services based on popular demand, it would appear that Jumla still has a great deal to teach the world.

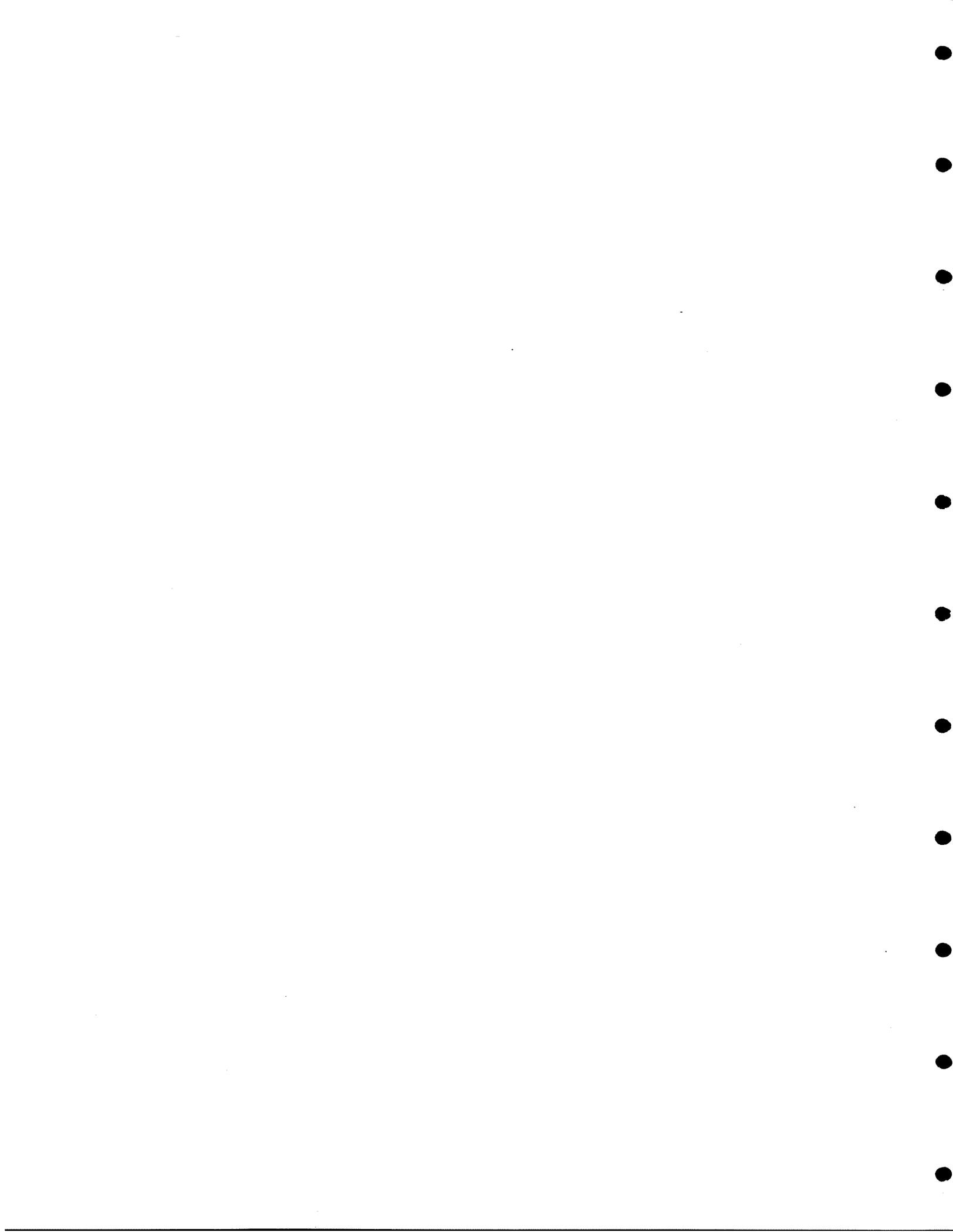
-7-

**COMMUNITY HEALTH WORKERS
AND ARI:
IMPLICATIONS AND
COMPLICATIONS**

René Salgado
Technical Officer

The Resources for Child Health (REACH) Project
John Snow, Inc.
1616 N. Fort Myer Drive, Suite 1100
Arlington, VA 22209

A.I.D. Contract No.: DPE-5982-Z-00-9034-00



I. INTRODUCTION

Long before Alma Ata and Primary Health Care (PHC), public health planners thought that a new type of worker should be trained. This new breed of worker was to be a volunteer member of the community who, at least in theory, knew his or her community better than a formal health worker from the ministry of health (MOH). Armed with this intimate knowledge, this "community health worker" (CHW) would be in a better position to serve the people who really needed help. Public health planners also thought that because members of the community would be more inclined to seek help from one of their own, CHWs' services would be more accessible and culturally acceptable. The cost-efficiency of such an intervention was taken as a given. All this was reinforced by the PHC declaration in Alma Ata in 1978. As a result, a global deployment of CHWs began.

As we are poised to add yet another intervention (control of acute respiratory infections) to the CHW list of tasks, it is an opportune time to examine some of the early lessons from a number of PHC programs already working in ARI. The REACH project is seeking answers to some of the questions and challenges posed by CHW programs. Through its work in Jumla, Nepal, REACH has been at the forefront of documenting CHW work in ARI. In addition, REACH is assisting in the implementation of ARI programs in the Philippines and Bolivia and has recently conducted an evaluation of a CHW program in ARI in El Salvador. This paper documents some of the early lessons and offers specific recommendations.

II. POLICIES REGARDING CHWs AND ARI

As ministries around the world begin to implement ARI programs, one of the fundamental questions they have to answer is whether to allow CHWs to dispense antibiotics. Since the ARI algorithm is quite simple and can be applied by a CHW to diagnose pneumonia, it would seem to follow that a CHW could dispense the appropriate antibiotics, at least for non-severe cases. However, in most ministries this is not a traditional role for the CHW, and some opposition has been found--especially among physicians. Nonetheless, it seems appropriate that a CHW dispense antibiotics in situations where access to a higher level of trained provider is limited or when it can help to increase the credibility of the CHW as a health provider.

Increasing Access

Experience in Jumla, Nepal and Bohol in the Philippines has shown that, with appropriate supervision and supply, a CHW can effectively dispense antibiotics. When considering whether to allow CHWs to dispense antibiotics, we must take the viewpoint of a sick child's mother, who has very difficult physical, cultural or financial access to the formal health system. What options are open to her? Unfortunately, not many. Perhaps her only viable option is a local CHW, trained in ARI standard case management and supplied with appropriate drugs. But how feasible is it to train and supply CHWs? Clearly, in light of the well known difficulties MOHs have in supervision and logistics, it is probably not feasible to universally deploy CHWs trained in standard case management. Consequently, the MOH has to define a role for the CHW that

addresses the needs of the child with an ARI and that anticipates the limitations of the health system.

In fact, as experience accumulates, it seems that at least two distinct roles for the CHW must be identified--one rural and one urban. It is reasonable to assume that most access problems will be found in rural areas. Rural CHWs should not only be able to dispense antibiotics in cases of uncomplicated pneumonia but also to address severe disease and severe pneumonia. The rural program planner must consider that referral is not possible in many cases and that the program must be able to respond in some way to the needs of the community. At the same time, the ARI program should be aware that urban areas are the most important contributors to pneumonia mortality. Consequently, a CHW role with emphasis on detection and referral might be more appropriate in urban settings.

Increasing CHW Credibility

A secondary effect of allowing CHWs to dispense antibiotics is the increase in credibility of the CHW in the community. Most often, MOHs overload CHWs with tasks that are mainly preventive and promotive. However, community members usually attach more importance to curative than to preventive services. Unfortunately, the typical CHW is not prepared to deal with curative demands. As a consequence, the CHW slowly loses, in the eyes of the community, importance as a health resource. Even though it may appreciate preventive activities, the community learns that the CHW is not prepared to deal with curative problems. By giving the CHW the ability to dispense antibiotics, the ARI program manager is indirectly increasing the CHW's credibility as a health resource. Since early recognition and treatment of pneumonia is key, this increased credibility will lead to mothers seeking out the CHWs for ARI problems and thereby receiving appropriate treatment.

As CHWs learn about antibiotics, planners should be aware of the potential difficulties. For example, REACH has found that individual CHWs can react quite differently when given a stock of antibiotics for the first time. Some CHWs, thinking that they will not be resupplied, will hoard their cache and not give complete treatments to patients. Others, wishing to be helpful to the community, might over-dispense the antibiotic for ailments that are not pneumonia. The health care system needs to reassure the CHW that antibiotics will be resupplied on a regular basis. If this is not done, the ARI program will be another unfulfilled promise that results in diminished community confidence and participation. If a resupply cannot be ensured, the ARI program should not engage CHWs in dispensing antibiotics. As far as over-prescribing is concerned, the ARI program manager should establish mechanisms to monitor CHWs' diagnosing and prescribing practices. The CHW should keep simple tallies of who, when, what signs, and what diagnoses and prescription were given. The CHW supervisor should review these tallies on a regular basis.

In some countries, strong opposition to the dispensing of antibiotics by CHWs will come from the organized medical community. It is critical that ARI program managers enlist the medical establishment early on because physicians can be formidable opponents. A careful plan of interaction with physicians should be developed. In some countries, medical, pediatric and respiratory-disease associations can be invited to participate in the design of the program. In

other situations, seminars and workshops can be organized by the ARI program to increase physicians awareness of the ARI problem and acknowledge the need to incorporate CHWs as fellow dispensers of antibiotics.

Another factor to consider when deciding whether to allow CHWs to dispense antibiotics is the legal status of CHWs in the country involved. Although most countries have laws describing community participation and CHWs, few, if any, have laws protecting a CHW from malpractice. Although, in the past, program planners have chosen to ignore the legal implications of CHW activities, it seems that with ARI, health planners need to take a more pro-active position and become advocates for health-code changes that accommodate the CHWs new role.

III. TRAINING

In the REACH experience, training is one of the most important components when working with CHWs in ARI. It is clear that educational materials designed for physicians and nurses are not appropriate for CHWs. In this respect, the set of materials developed by the WHO specifically for CHWs is a significant milestone. These CHW materials can be obtained in computer files, thus making them easily adaptable to different environments. REACH has utilized them with success in a pilot project in the Philippines.

By definition, training materials for CHWs should be simple. However, simplifying the ARI algorithm is not an easy task. In this light, the WHO materials contain an important variation from the standard algorithm used by physicians. Respiratory cut-offs have been reduced from 3 to 2. Infants under 2 months of age are classified as having fast breathing if their respiratory rate is 60 or more, and children between 2 months to 5 years of age are classified as having fast breathing when their respiratory rate is 50 or more. The category between two months and 1 year has been eliminated.

These changes have two important implications. First, a number of children will be misclassified because of the diminished specificity of the test, especially in the 1-to-4-years-of-age group. In other words, there will be more false negatives: some children with pneumonia will be classified as having no pneumonia. However, these will be older children who are less likely to die from the disease than are younger infants, and this trade-off seems acceptable in light of the increased usability and simplicity of the algorithm. Since most pneumonia deaths occur in the less than 1-year-of-age group, it was particularly important that this group not be affected by the change. The second implication of the algorithm change is that when children are referred to a health facility, the CHW diagnosis will not necessarily be the same one given by the physician or nurse. A mother may be given two different diagnoses. To alleviate this possible confusion and loss of CHW credibility, CHWs, physicians and nurses need to be made aware of the differences in the classification and the reasons for these differences.

Some countries (e.g., Bolivia, Philippines) have made additional changes to the CHW algorithm. In some cases, the number of danger signs have been reduced, or the types of diagnoses have also been reduced. Although this further simplifies the algorithm for the CHW, it has the

potential of producing considerable confusion when referrals are made; interpretation of data kept by the CHW is also difficult. For example, in Bolivia the severe

disease category has been eliminated from all age groups. This means that a child with severe disease (according to WHO guidelines) will be classified as having severe pneumonia. This will certainly cause a skewed epidemiological picture and make data generated using this classification difficult to interpret and to merge with other data collected using a different classification.

Training in ARI must, by definition, emphasize practice. This is particularly so with CHWs. Although videos are available for viewing (fast breathing and chest indrawing) and hearing (wheezing and stridor) clinical signs, there can be no replacement for actual clinical practice. The CHW should practice, whenever possible, with patients representative of those he/she might see in the community. In Nepal, program managers have found that not until a CHW is able to appropriately assess a child at least three consecutive times can the CHW be considered trained.

Thought must be given to who will carry out the clinical training. In general, trainers should be experienced. REACH has found that even experienced ARI program managers are not necessarily good trainers if they are not in daily patient contact. Assessment skills must be practiced as much as possible in order for skills to be sharp. In addition, there can be many distractions (e.g., an irritable or feeding child) at the moment a patient is assessed that might not be covered in the training materials. A trainer must be able to give recommendations on what to do in such cases. Finally, although the standard case management algorithm is very definite, there are also certain "tricks" that the trainer can recommend when caring for a child or giving medicine, many of which can be learned only through daily clinical practice.

Another problem the program manager might face in training deals with integration of ARI with the other child survival interventions. As ARI training is integrated, there will be the inclination to reduce the number of training days available for practice. If this happens, the quality of training will suffer. MOHs must recognize that even though training integration is desirable, reduction in time available for ARI practice will have deleterious consequences. A minimum of four to five days must be assured for ARI training alone.

As with other practical abilities, it is necessary that CHWs receive regular retraining. Counting respiratory rate, identifying chest indrawing and listening for wheezing and stridor are easily lost skills. Therefore, the program planner must have in place a plan for refresher retraining of the CHWs at least once a year. Additionally, supervisory visits should always include practice and review sessions.

Equipment

Using appropriate timepieces is of critical importance. A timer should enable the CHW to take an accurate 1-minute reading without forcing the CHW to look away from the child's chest. This can be achieved with a timepiece that emits a sound at 30-second and/or one-minute intervals. The UNICEF timer, designed specifically for the global ARI program, meets these criteria and is quite easy to use. However, at the time of the writing of this

document, sufficient quantities for worldwide distribution were still not available. Because of this, some programs are recommending that wristwatches be used. Another alternative is the Teaching Aids at Low Cost (TALC) sand timer. Whatever timepiece is used, the mother should be invited to assist in the assessment of her child by holding the timepiece and helping the CHW count the minute. This, besides getting the one-minute reading, teaches the mother about fast breathing.

IV. COMMUNICATING ARI MESSAGES

Another critical piece of the ARI puzzle is the communication of educational messages to the community. Specifically, what danger signs the mother should look for, when to take the child back to the health provider, how to give medications, and how to provide adequate home care for the child. Each of these messages has variations according to the diagnosis, age of the child and type of provider seeing the child. The number and complexity of key educational messages can overwhelm the mother. Consequently, the ARI program manager should strive for simplicity and adequacy when instructing CHWs what to communicate to mothers. The most critical messages are how to identify danger signs (i.e., fast breathing, chest indrawing, wheezing), instructions on when to go back to health provider (i.e., in two days or if the child does not improve), and the appropriate steps in home care (e.g., use of home liquids, compliance with treatment).

In addition to what to communicate, the trainer must also teach the CHW how to communicate. In the rush to assure technical appropriateness, the "how" of communication can be easily lost. The trainer must be prepared to work with CHWs on the do's and don'ts of communicating with mothers. Simple tools such as WHO's home care card can be adapted for local use. However, care should be taken that materials and technologies introduced into the community have a reasonable chance of being reproduced locally or an outside supply maintained. Finally, an initial ethnographic study can go a long way toward helping the program manager understand the cultural perceptions and terms used to refer to ARI and pneumonia. These terms, of course, should be shared with CHWs and higher-level health workers.

Showing mothers how to prepare and give medications is one of the last steps in the CHW and caretaker interaction. Because of costs, most countries will probably decide to use cotrimoxazole in tablet form for the treatment of pneumonia. Since cotrimoxazole in tablet form has a bitter taste, it is natural that mothers will have problems with its administration. Therefore, the CHW can play an important role in helping mothers comply with treatment. CHWs must be able to show and give clear instructions on how to prepare (crush) and give (mixed with sweet liquids) the cotrimoxazole tablets. In addition, the CHW should be prepared to answer the mother's questions regarding the possible side effects of the medication and warn her about the consequences of stopping treatment. The CHW must also be knowledgeable about the uses and misuses of cough and cold remedies, such as commercial cough syrups or traditional remedies. Although many of the traditional remedies are innocuous, some, like rubbing petrol gas on the child's chest (used in Latin America and the Philippines), are dangerous and should be aggressively discouraged.

V. SUPERVISION

One of the most serious problems that CHW-based ARI programs face is supervision. Most countries have few resources to commit to supervision of CHWs. Nevertheless, a program that has lay community workers dispensing antibiotics must be closely monitored. A balanced solution that considers the MOH's resource limitations and the operational needs of the ARI programs must be developed.

In the Nepal experiment, CHWs were supervised by health professionals at least every two weeks. This produced a very high quality of service. However, this frequency of supervision is unattainable in most country programs. On the other side of the spectrum, CHWs usually go for a year or more without a supervisory visit. Consequently, program managers must find creative ways of supervising and maintaining quality without overwhelming the system. As an alternative to on-site visits in the province of North Samar, the Philippines, supervisors meet with CHWs on a monthly basis to review records, discuss problems, and reassess abilities. Although it is more desirable to do on-site supervision, given the constraints, a monthly meeting of this kind can be effective. In fact, in some countries, attendance at monthly meetings is taken as evidence of CHW "activity." This way, the few resources that are available for supervision can be targeted to those CHWs who absolutely cannot attend meetings and should be visited by the supervisor.

However supervision is conducted, the supervisor should have a clear idea of what is to be supervised. A list of items to be supervised can be helpful. Among the items to oversee are charts or lists of children consulted, their physical assessment, their diagnosis, and their treatment or referral. On items such as antibiotics, there should be a clear balance between the types of diagnosis and the amounts of drugs on hand. Presence or absence of working timepieces should also be included on the list. The supervisor should check for educational materials, manuals and wall charts. At the same time, the supervisor should query the CHW about cases, ask about problems, and offer possible solutions. Of course, the supervisory checklist should be based on the CHW's job description, so there is agreement between the expectations of the health service and what the CHW understands his/her job is.

Supervisory visits, when done appropriately, can go beyond simply serving to assure quality. Supervision can serve as an important motivator-- as a source of moral support and of credibility in the community. This type of support is extremely important in the ARI program since it is very likely that CHWs will come under pressure from the community to give antibiotics. If not reassured by the supervisor that his/her refusal to dispense antibiotics inappropriately was correct, the CHW might give in to the demands of the community.

In conclusion, although supervision is key, the ARI program manager needs to find a balance between the ideal and the feasible.

VI. REFERRAL

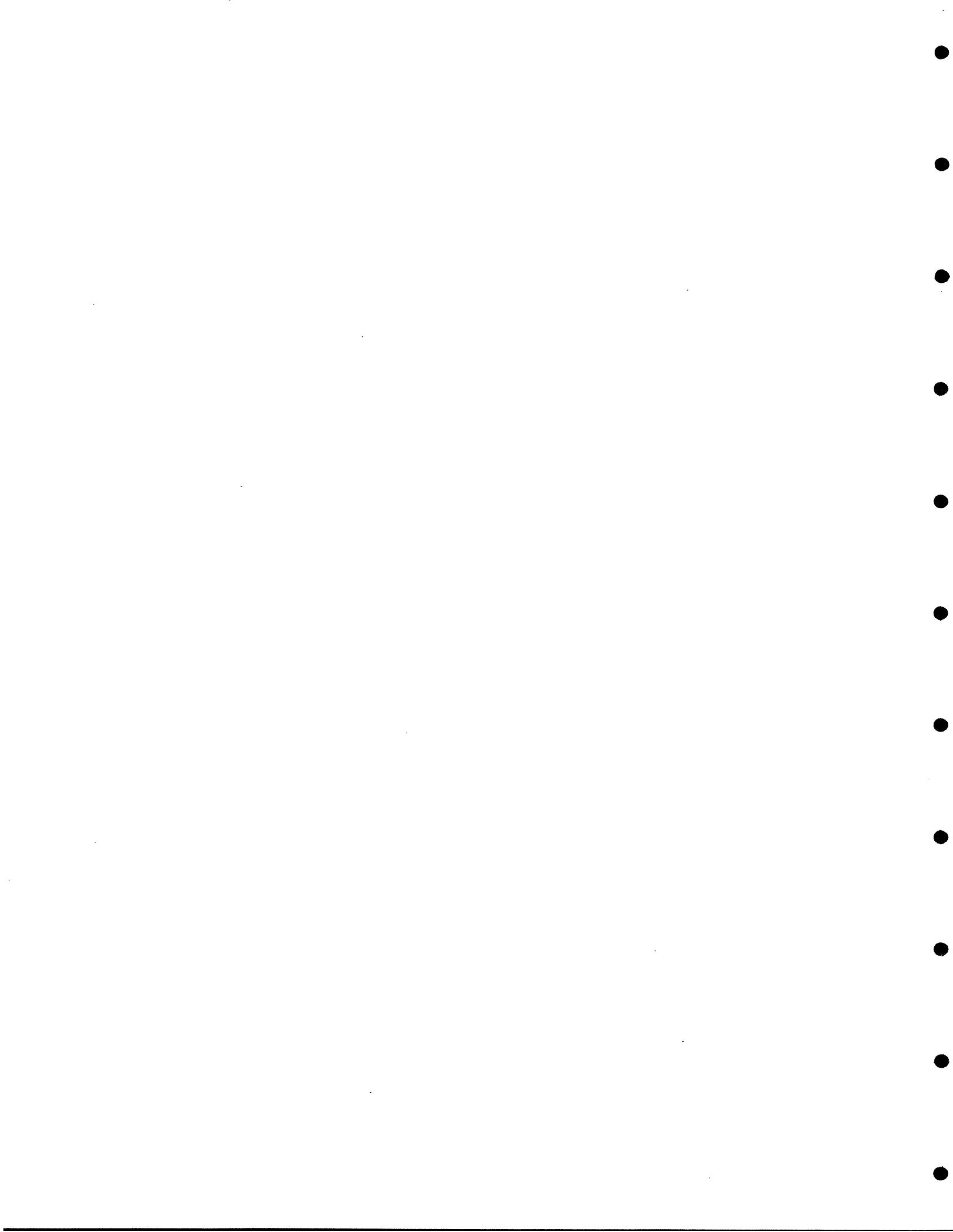
Another important component of CHW programs that never seems to work is the referral system. Stories about CHWs sending referrals to the nearest clinic or hospital and mothers being turned away are very common. Part of the problem is due to physicians and nurses being unaware of the role of the CHW and consequently showing very little concern for their referral. The ARI program manager needs to incorporate staff working in the referral centers into their training schemes. This way, all players are informed about their own and others' roles in the ARI program. Also, both program managers and CHWs should visit referral centers regularly to remind physicians of the importance of referral and counter-referral.

The program manager should pay particular attention to discrepancies between the diagnosis made by the CHW and the diagnosis made by the physician or nurse. It should be remembered that, in most countries, due to the differences in algorithms, there will be differences in the diagnoses made by the physician and those made by the CHW. Both physicians and CHWs should be aware of this and be careful when informing the mother. In fact, these differences should be part of the training curricula for all health workers participating in the ARI program. It is important that physicians do not denigrate or contradict the CHW.

For many years, program managers have dealt with how to best track referrals. In many cases, standard referral slips are issued to the mother. She then takes the slip to the nearest referral center. These referral slips range from the simplest "pictograph" to the most complex clinical histories. In any case, unless there is a way to reproduce them locally, chances are that once the initial batch is exhausted, there will be no more. Although it would be optimal to be able to track referrals, experience shows that, in most cases, it will not be feasible. Nonetheless, the CHW can do effective follow-up in his/her community. Although it would be impossible to follow up all ARI cases, the CHW can effectively follow up pneumonia, severe disease and severe pneumonia. The CHW should be instructed to visit the home of the child one or two days after the referral.

VI. CONCLUSION

These are some of the lessons, implications and complications that have been learned in working with CHWs in ARI programs. It is clear that, as the global ARI program matures, new and different approaches will emerge. In the meantime, the deployment of CHWs in ARI programs needs to be carefully monitored and evaluated. Although there are early indications that the approach works, it is not clear if it is cost effective. Program managers need to take a critical look at how the deployment of CHWs affect their already thinly stretched support systems.



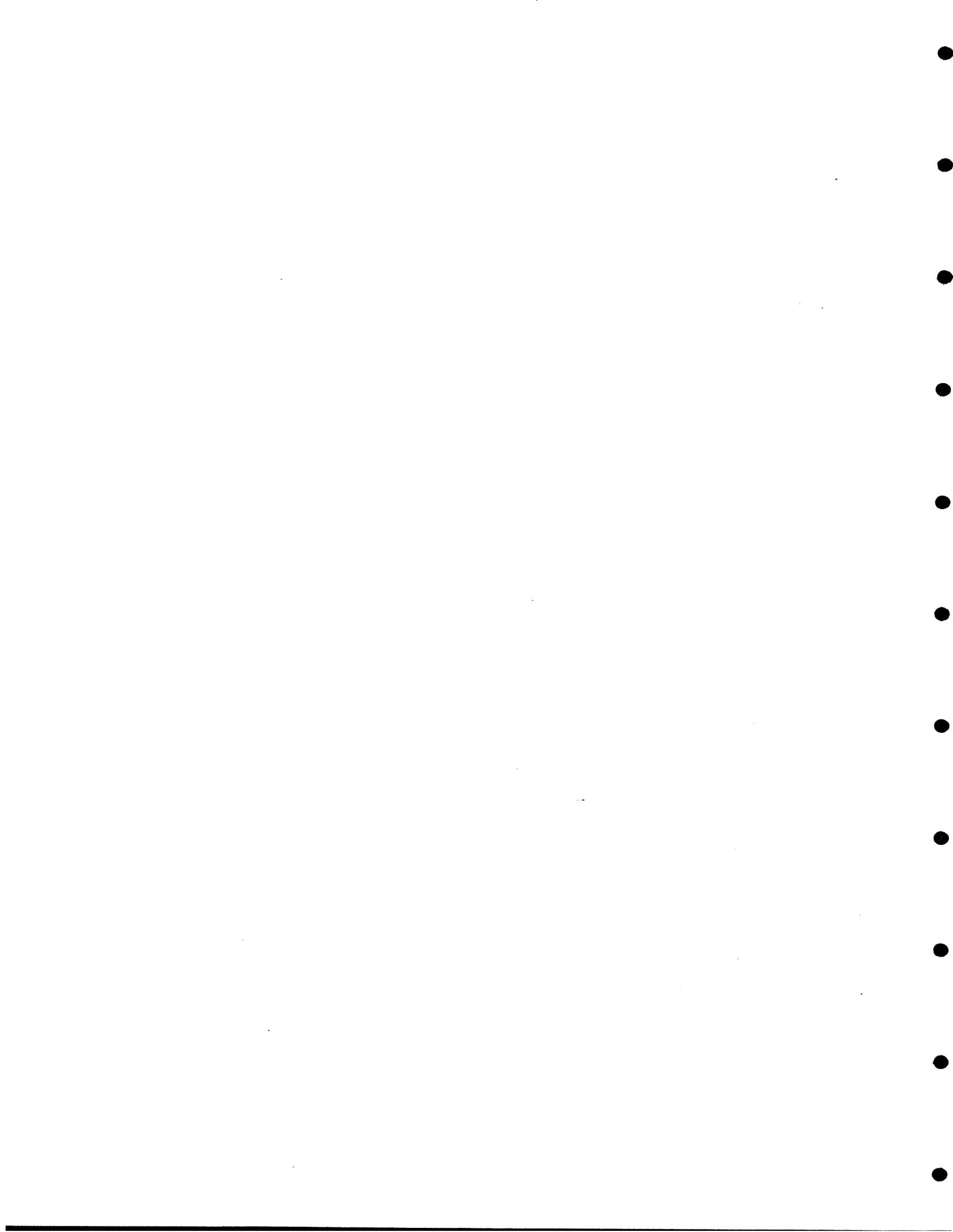
-8-

**USE OF STANDARD CASE
MANAGEMENT AMONG BOLIVIAN
HEALTH PROFESSIONALS TREATING
ACUTE RESPIRATORY INFECTIONS**

René Salgado
Victor Lara
Nils Daulaire
Michael Favin

The Resources for Child Health (REACH) Project
John Snow, Inc.
1616 N. Fort Myer Drive, Suite 1100
Arlington, VA 22209

A.I.D. Contract No.: DPE-5982-Z-00-9034-00



I. INTRODUCTION

Acute respiratory infections (ARI) are today the leading cause of death worldwide among children under five. The large majority of these ARI deaths are due to pneumonia, which is estimated to cause nearly 4 million child deaths per year in the developing world.

An approach to dealing with childhood pneumonia, known as "standard case management," has been developed by the World Health Organization (WHO) and extensively field tested. Standard case management (SCM) is based on a simple but rigorous three-step procedure consisting of assessment, classification, and treatment. When rigorously applied, SCM has been highly effective, reducing child deaths by as much as 28%.

Assessment emphasizes the recognition of two key signs of pneumonia: **fast breathing** and **chest indrawing**. Among higher-level health workers, assessment may also be expanded to include listening for wheeze or stridor and checking for a limited number of additional signs.

Classification assigns simplified diagnostic categories based on the signs that are found according to the age of the child. The classification categories recommended by WHO are:

- *no pneumonia (simple cough and cold);*
- *pneumonia;*
- *severe pneumonia; and*
- *very severe disease.*

Standardized treatment protocols have been developed to address each of these categories. Prescription of cough suppressants is generally discouraged as a dangerous practice in any child. Children with *no pneumonia* should not receive antibiotics. Those with *pneumonia* should receive antibiotics on an outpatient basis; principally recommended are oral cotrimoxazole, amoxicillin, and ampicillin, and injectable procaine penicillin. Children with *severe pneumonia* or *very severe disease* should be hospitalized if at all possible. If hospitalization is impossible, they should be treated as outpatients, but with closer monitoring than simple pneumonia cases.

Bolivia has the highest child mortality rate in South America. Statistics published by the Bolivian Ministry of Health rank pneumonia as the second leading cause of death among children under five, responsible for nearly 12,000 child deaths annually. Furthermore, ARIs are by far the leading reason for consultations at government clinics. These factors have made development of rational programs directed at childhood pneumonia a priority in Bolivia, and the Ministry of Health has adopted a policy to make SCM the norm at all outpatient facilities.

Although for several years, SCM has been accepted as national policy in Bolivia, and many health providers have been trained in SCM, little was known concerning actual treatment of children presenting with signs of acute respiratory infections in government and other clinics. Although SCM should rationalize the prescription of antibiotics for ARI, reducing drug usage and expenditures, both

the Ministry of Health and the large private-sector provider PROSALUD in Santa Cruz noted that excessively high usage rates of antibiotics for ARI continued to be a major drain on resources. In order to assist the Ministry of Health and other health care organizations to clarify current practices and identify barriers to more effective implementation of SCM, a baseline assessment of health providers' current knowledge and practices was conducted.

II. STUDY DESIGN

This study was conducted in May 1993 among physicians and nurses working in facilities involved in the direct provision of outpatient care in the urban area of Santa Cruz de la Sierra, the nation's second largest city, located in the low-lying, eastern region of Bolivia. While this area is considerably different, both climatologically and culturally, from the colder high valleys and highlands principally inhabited by indigenous descendants of the Inca empire, it was felt to represent what was likely to be the "best case scenario" for health care services in the country. Findings from this study could therefore be expected to define the upper end of national performance. Facilities studied were governmental and nongovernmental clinics, health posts and outpatient departments.

The study design was adapted from the WHO ARI Health Facility Survey protocol. This protocol, tested extensively in many parts of the world, is rapidly becoming an important tool in the assessment of ARI programs. It consists of standardized questionnaires for assessment of: (1) the capacity of the health facility to provide SCM (e.g., availability of antibiotics, presence of SCM wall charts, etc.); (2) practitioners' knowledge, attitudes and practices of SCM; and (3) practitioners' practices via a review of patient charts. The most important deviation from the WHO protocol made for this study was the exclusion, because of time limitations, of direct observation of practices. Other adaptations were made to questionnaires to bring them into line with the Bolivian SCM algorithm.

Sampling

The researchers used a 30-cluster sampling technique to select facilities for the study. According to the WHO methodology, a minimum of 60 pneumonia cases is needed for review. Since an initial review of facility records indicated that 5% of all ARI cases were pneumonia, the researchers calculated that 1,200 records (ARI cases) would be needed for analysis. Facilities could only be included if they: (1) were within the urban area of Santa Cruz, (2) at the time of the survey had personnel attending children under five years of age in a primary health care setting, and (3) kept records that could be reviewed at the facility. A list of all facilities (35) that met the above criteria was produced.

The list included the average number of ARI cases and expected pneumonia cases as well as a cumulative listing of all ARI cases. A probability proportional to size sampling method was then used to select the specific health facilities to be surveyed. The total number of records to be reviewed at each facility was computed as 40 (1,200 records/30 facilities). Because of their size and the total number of facilities, a few of them were selected more than once giving an $n=26$. One final deviation from the protocol was that only a total of 1,046 ARI cases were included in the final tally since the total number of pneumonia cases identified (91) already exceeded the required 60, and

the researchers, because of time constraints, decided to halt the review. The final list consisted of hospital outpatient services (2), health centers (21), and health posts (3). The sample also included 11 ministry of health and 12 nongovernmental facilities and 3 classified as other.

Questionnaires

Separate questionnaires/instruments were used: (1) personnel interviews; (2) facility interviews, and (3) a record review. All instruments paid particular attention to the major components of SCM (assessment, classification and treatment). The personnel interview questionnaire collected information on providers' knowledge and attitudes toward SCM. Providers were presented with ARI cases and asked to classify or indicate treatment. Also, specific questions on signs (e.g., respiratory rate) were included. This questionnaire completed for all health providers present at the health facility at the time of the survey (65). The facility instrument included questions regarding the presence/absence of antibiotics, timers (to measure breathing rates), SCM wall charts and other educational materials necessary for an effective ARI program. Finally, the record review instrument was used to collect data on ARI cases, such as age of child, vital signs (specifically respiratory rate), presence of cough, chest indrawing, wheezing or stridor. The diagnosis and treatment was also recorded.

Analysis

All data were tabulated using Epi Info 5.01b and Quattro Pro 4.0. In the case of the record review, additional information was gathered from local pharmacies and the participating agencies to estimate treatment costs. Additionally, because of the wide diversity of diagnoses encountered (more than 20), the researchers reduced the number of diagnostic categories to seven so that the data could be more easily interpreted.

III. RESULTS

The main findings of the study were the following:

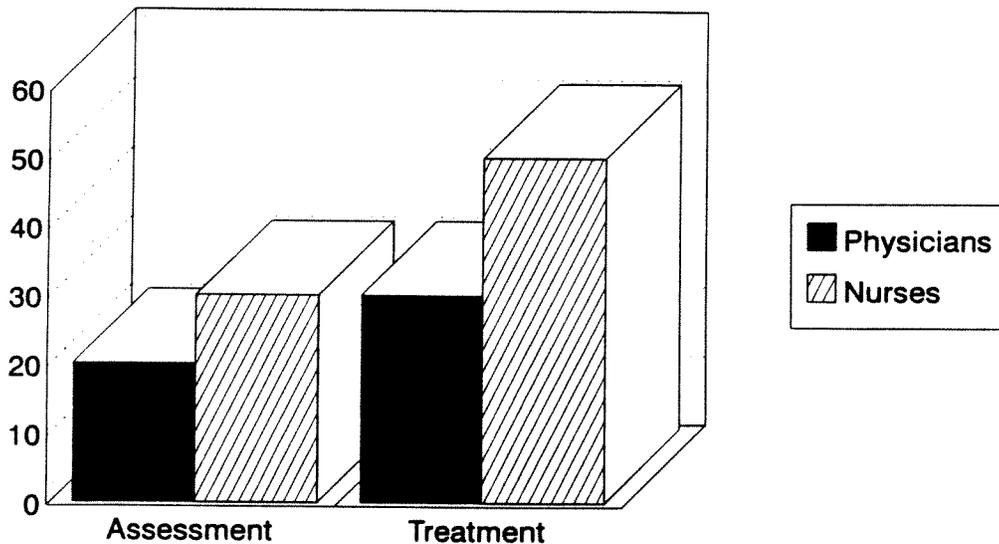
- Health workers currently treating children with ARI do not use SCM.
- There is extensive inappropriate use of antibiotics.
- Quality control mechanisms for SCM are lacking.

Health Providers

A total of 65 interviews were conducted, 43 with physicians and 22 with nurses. Most reported not having yet received training in the new SCM algorithm. The researchers analyzed the data from three perspectives. First, knowledge of assessment and classification; second, knowledge of appropriate management; and third, the combination of the above two to get an overall picture of the appropriateness of SCM.

Only 26% of all respondents had appropriate knowledge, defined as correctly answering at least 3 out of 5 questions on assessment/classification, to classify ARI cases. It was found that nurses (32%) performed significantly better than physicians (23%). When the group of physicians was broken down by specialty, the general practitioners tended to perform better than the pediatricians.

Figure 1
Proportion of Health Providers with Correct Answers



Source: PROSALUD Health Facility Survey, May, 1993.

The management component of the algorithm fared slightly better than classification. Approximately 38% of the respondents correctly answered at least 3 out of 5 questions. As with the classification component, nurses (55%) were ahead of physicians (33%) in correctly answering the management questions.

The combination of overall knowledge (classification and management) indicated that only 15% had what was considered reasonably good knowledge; 32% showed some knowledge but not what was considered sufficient to carry out SCM; and 52% had inadequate knowledge. All 15% of providers that had good knowledge were working in health centers, which meant that none of the 15 respondents from the hospital-based facilities had adequate knowledge.

An important finding was that, overall, most staff who said that they had received training in SCM (20% of all staff interviewed) did not perform significantly better than staff who did not received training. However, there were differentials between nurses who said that they had received training as opposed to physicians. Nurses performed consistently better.

Health Facilities

Most facilities had many of the materials needed to support SCM. Twenty-two of the 26 facilities had the appropriate antibiotics on hand. However, manuals (73%), wall charts (50%) and other ARI educational materials (31%) were found in insufficient quantities for good program implementation.

Record Review

The record review was very revealing, especially in light of the low level of knowledge among practitioners. A total of 91 cases of pneumonia. Of the 1046 records, only seven had a respiratory rate recorded. Of these seven, the only two that could have used the respiratory rate for classification used it inappropriately. Only three physicians noted the presence of chest indrawing, although many more children should have had it.

Of the 1,046 children with ARI, 74% received one or more antibiotics, many more than would have needed them according to SCM. Although most doctors agree that coughs and colds are mostly of viral origin and thus should not be treated with antibiotics, a full 55% of physicians nonetheless prescribed an antibiotic for a cough or cold. In 60% of the cases reviewed, two antibiotics were prescribed, and in 1% three were prescribed.

Of the pneumonia cases, 27% received a recommended antibiotic (cotrimoxazole, ampicillin, amoxicillin or procaine penicillin). An additional 25% received benzathine penicillin. Although now discouraged, benzathine penicillin was part of the first algorithm for pneumonia in the latter part of 1980s.

Costs

The study concluded that if SCM had been used appropriately in the diagnosis and treatment of the 1,046 cases reviewed:

- The health institutions could have reduced their antibiotic expenditures by 66%.
- The families could have reduced their antibiotic expenditures by 78% to 86%.

IV. STUDY RECOMMENDATIONS

The Bolivian study's specific recommendations cover many similar areas:

Training

1. The methods used for clinical training of physicians should be reviewed. Training should focus primarily on clinical practice. A five-day rotation system can be used in health facilities, utilizing mornings for care of children in hospital inpatient and outpatient settings. Each person trained should have a tutor who is totally comfortable with practicing SCM and the proper use of antibiotics. A trainer who recommends something but does not put it into

practice can jeopardize the program. Afternoon sessions should review the scientific bases of SCM, PAHO/WHO manuals, and ARI and pneumonia cases.

2. The development of training centers, specifically for ARI or for several essential programs that include ARI, is important. Hospitals with the greatest number of pneumonia cases per week can be given the training materials and equipment needed to become centers for training and monitoring the quality of the health services. The number of workers rotating through the health centers should be the maximum possible to avoid congestion in the hospitals, and the minimum possible to avoid delays in the implementation of SCM.
3. The trainers ensure that SCM is used in their facilities. A quality control and follow-up system should be established to ensure proper SCM. The organization of a system of visits and observations of SCM, or record reviews, is necessary. The supervision of medical personnel should focus strictly on the clinical aspects of SCM, while avoiding adding administrative and logistical activities to their duties, especially with respect to the provision of drugs. This task should be the responsibility of the regular drug logistics system.

Sustainability of SCM

1. The program should ensure that new physicians and health workers are able to receive clinical training before coming to the health facilities, whether this training occurs at the university or before their government employment. This practice should ensure that the health facilities are provided with trained workers, even if the individuals change over time.
2. Efforts should be made to incorporate private-sector medical personnel. They should be included in the training programs. New alternatives should be introduced into the program in order to achieve changes in the therapeutic practices of physicians, utilizing the private sector and the pharmaceutical industry. One interesting alternative would be to use the marketing strategies of the pharmaceutical industry to promote the use of cotrimoxazole in private practice.

Monitoring Program Quality

1. Establish systems to monitor the quality of the services provided, utilizing a simplified methodology by PAHO/WHO to survey health facilities.
2. Develop teams to review quality problems as soon as they are identified. These multidisciplinary teams should include personnel at all levels who are affected by the problem.
3. Define simple quality control indicators (e.g., number of records that note respiration rate, number of records that utilize the SCM classification, cost of treatment of ARI cases per thousand cases of cough and respiratory difficulty, etc.), and establish goals for periods of less than one year.
4. Develop mechanisms to ensure the minimum of information that should be included in

clinical records, thereby making possible the monitoring and evaluation of the quality of ARI services.

Results of the Study

In Bolivia, the dramatic, although not unexpected findings of the study in Santa Cruz have led to promising steps. The involvement of key public and private-sector medical officials in the planning and implementation of the study increased interest and receptivity to the findings. A seminar at which the study findings were presented generated great enthusiasm among previously resistant pediatricians for the use of SCM for pneumonia. The Ministry of Health and the major private-sector provider PROSALUD are planning to actively promote training for SCM and to develop a regular review process of medical records to monitor recording of key signals of ARI.

V. DISCUSSION

As shown by the Bolivia study and by studies and experience in other countries, simply training health providers in SCM by no means guarantees that these providers have acquired the knowledge, skills, or willingness to use SCM consistently or correctly. Training and support systems need to be modified to help overcome many factors which mitigate against easy adaption of this effective algorithm:

- Physicians were initially trained to use more sophisticated technologies such as stethoscope, laboratory tests, and x-ray to diagnose ARI. Thus, SCM diagnosis appears to be too simple and non-technological to be scientifically valid. In addition, as in Bolivia, confusion was created by training some providers in an earlier version of SCM that was officially superseded by the current version in 1989.
- Treatment of ARI according to SCM not only contradicts previous training but also years of experience by physicians in actually diagnosing and treating ARI using other criteria. In addition, an important objective of physicians, particularly in the private sector, is to satisfy their clients. There is a vicious cycle of mothers demanding antibiotics and cough medicine and physicians prescribing them because physicians believe the mothers want them. Furthermore, particularly in urban areas, drug companies use many methods (medical seminars, visits by detail men, free samples, "educational" literature, etc.) to convince physicians to prescribe multiple, complex drugs for ARI and other illnesses. Pharmacists, who de facto prescribe in most countries, are subject to many of these same pressures, in addition to the direct profit motive, to overprescribe.

Although program planners do not yet have complete knowledge of how to overcome these barriers to adoption of the desired behavior (correct and consistent use of SCM by providers), a number of general principles have emerged from experiences in Bolivia and elsewhere.

- Training should: (1) present sufficient evidence in appropriate formats to convince providers of SCM's scientific validity; (2) be hands-on, practical--it must include

actual diagnosis, classification, and treatment of as many children as possible; and (3) be reinforced as often as possible through supervision and in-service training. In designing training, possible barriers for adoption of SCM by physicians, with emphasis placed on specialists, should be identified and addressed.

- **Support Systems:** (1) Training must be reinforced through routine supervision and reporting; and (2) trained providers must have a reliable supply of essential antibiotics and appropriate reporting forms (in Bolivia, most patient records reviewed had no appropriate place to record the patient's respiratory rate), as well as job aids such as SCM charts and take-home materials for mothers.
- **Mothers' Expectations:** Providers' support of the SCM treatment protocol must be supported by a change in mothers' expectations to always receive drugs for a sick child. Locally appropriate media--including counseling, take-home materials, mothers' club meetings, and mass media--should be used.
- **Drugs:** Aggressive educational campaigns, for both mothers and practitioners, should be undertaken to discourage the indiscriminate use of antibiotics and/or cough suppressants and other dangerous drugs. For providers, support to SCM's use of a few simple, common, and inexpensive antibiotics must be supported through the same media that drug companies use to promote unnecessary prescribing--medical seminars, journal articles, professional societies. Support should also come from a country's Essential Drug Program.

