

REVIEW OF VITAMIN A PROJECTS IN MALAWI

**I. ADRA - VITAMIN A DELIVERY PROJECT
(DAN-0045-G-SS-7110-00)
(Final Evaluation)**

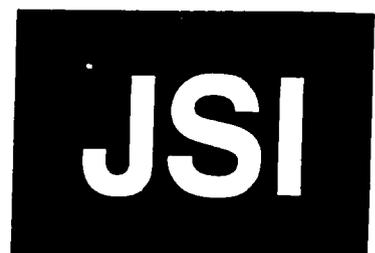
**II. IEF - VITAMIN A PROJECT
(OTR-0500-A-00-9159-00)
(Mid-Term Evaluation)**

by

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TABLE OF CONTENTS

Map	
Acknowledgement	
Glossary	
Introduction	
I. <u>ADRA Vitamin A Delivery Project</u>	
A. Background	
1. Project Scale-Back	I-1
2. Project Setting	I-2
B. Project Outcomes	
1. Coverage	I-3
2. Personnel Training	I-3
3. Education	I-6
4. Production of Vitamin A-Rich Foods	I-8
	I-9
C. Project-Related Issues	
1. Vitamin A Deficiency Prevalence	I-9
2. Coverage Verification	I-9
3. Reporting Guidelines	I-11
4. Financial Considerations	I-11
5. Collaboration	I-12
6. Sustainability	I-13
	I-14
D. Recommendations	
	I-14
Appendices	
I. Scope of Work	
II. Documents Reviewed	
III. Persons Contacted	
IV. Seminar Agenda	
V. Description of LQAS Methodology	
II. <u>IEF Vitamin A Project</u>	
A. Background	
1. Project Development	II-1
2. Project Setting	II-1
	II-2
B. Project Description	
	II-3
C. Findings	
1. Manpower Development	II-4
2. Intervention Coverage	II-5
3. Information Systems	II-5
4. Collaboration	II-7
5. Community Interaction	II-10
	II-11

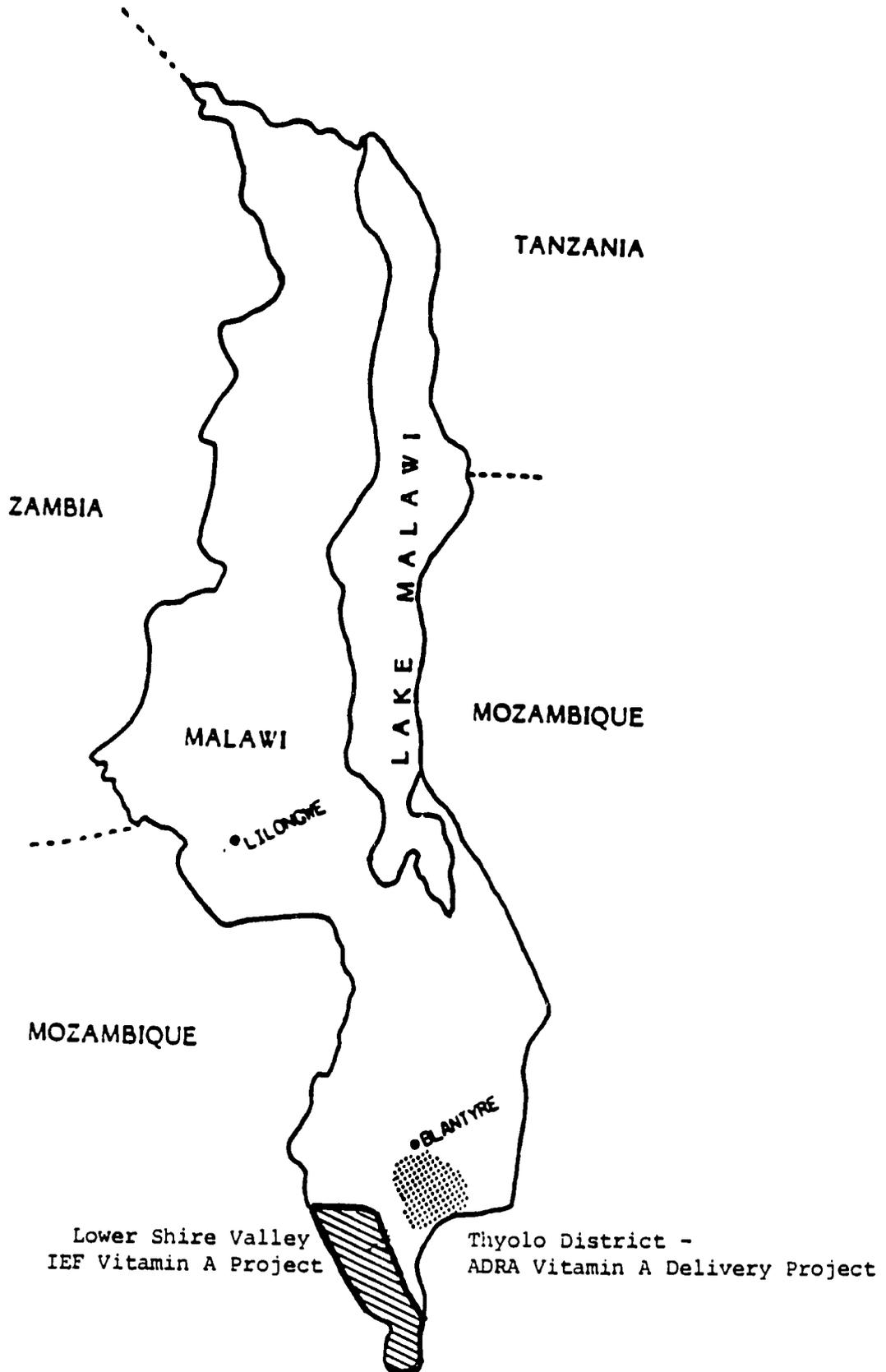
6. Sustainability	II-12
7. Finance and Budget	II-13
8. Interaction with A.I.D./Washington	II-15
D. Recommendations	II-16
E. Future Considerations	II-17

Appendices

I. Scope of Work	
II. PVC Mid-Term Evaluation Guidelines	
III. Documents Reviewed	
IV. Persons Contacted	
V. Brief Project Description	
VI. Organization Diagram	
VII. Task Description for HSA	
VIII. Training Materials for HSA and VHP Trainings	
IX. Tasks of the VHP	
X. VHP Training Objectives	
XI. VHP Training Course	
XII. VHP Roster	
XIII. HSA Monthly Report	

27

ADRA & IEF PROJECT SITES IN MALAWI



ACKNOWLEDGEMENTS

I would like to express my appreciation for the insights provided by all those who participated in the project reviews. A special vote of thanks goes to those team members who survived the horrendous dust storm conditions of the Lower Shire Valley. While the clouds of sand and dust made it difficult to concentrate on the intricacies of the vitamin A project, the conditions made it easier for all of us to appreciate the struggle for existence that takes place in this area daily.

I believe that the joint nature of these two reviews was very valuable. To begin with, it brought together the directors of the two projects who discovered that they both hailed from the great State of Idaho. This fact alone will go a long way to assuring that the collaboration will be sustained. Giving each project the opportunity to view the operations of the other is most worthwhile. I personally endorse the joint review idea as a way to foster closer cooperation and a greater appreciation for the experience and expertise which exists in close proximity.

We all benefitted from the participation of the Ministry of Health representatives. The officials from the Regional Office were especially helpful in identifying the ways in which they could assist and support the PVO efforts.

I commend and encourage USAID/Lilongwe's attempt to bring the five American PVOs having Child Survival grants in Malawi together. The greater understanding of what each of these agencies is doing is bound to be mutually beneficial.

My thanks to HKI, especially Anne Ralte (Director, VITAP) and Diana DuBois (Project Officer, VITAP), for organizing this assignment and assuring that it came off as planned. I applaud their initiative, identifying the possibility of a joint review and then making it happen.

Finally, everyone on the evaluation team express his/her gratitude for the time the village members took out of their busy and very difficult lives to discuss the project's activities with us. We were impressed by what they had been able to accomplish in the face of great odds. We are sure with their commitment and determination, even greater things are possible in the future.

GLOSSARY

ADRA	Adventist Development and Relief Agency
A.I.D.	Agency for International Development
AVRDC	Asian Vegetable Research and Development Center
CONVERDS	Collaborative Network for Vegetable Research and Development in the Southern African Region
DDC	District Development Committee
DHO	District Health Officer
DIP	Detailed Implementation Plan
EPI	Expanded Program of Immunization
FVA	Food and Voluntary Assistance
IEF	International Eye Foundation
HKI	Helen Keller International
HSA	Health Surveillance Assistant
IMR	Infant Mortality Rate
LM	Lactating Mother
LQAS	Lot Quality Assurance Sampling
MCH	Maternal Child Health
MCP	Malawi Congress Party
MOH	Ministry of Health
NGO	Non-Governmental Organization
OMA	Ophthalmic Medical Assistant
ORS	Oral Rehydration Salts
ORT	Oral Rehydration Therapy
PCV	Peace Corps Volunteer
PVC	Private and Voluntary Cooperation
PVO	Private Voluntary Organization
TBA	Traditional Birth Attendant
TT	Tetanus Toxoid
VITAL	Vitamin A Field Support Project
VITAP	Vitamin A Technical Assistance Project
VHP	Village Health Promoter
WCBA	Women of Child Bearing Age

INTRODUCTION

This joint review consists of a final evaluation of the ADRA Vitamin A Delivery Project in Thyolo District and a mid-term evaluation of the IEF Vitamin A Project in the Lower Shire Valley, both in southern Malawi. This consultancy was carried out at the request of Helen Keller International under its Vitamin A Technical Assistance Project (VITAP), which is charged with providing support (e.g., design, technical, management, evaluation) to the PVOs having vitamin A activities.

Separate reports have been prepared on each of the two vitamin A projects. A summary of the main findings of each is as follows:

ADRA - The Vitamin A Delivery Project has achieved its target of reaching 55% of the vulnerable population in the project area with vitamin A supplement. The Project trained a large number of community-level workers during the course of the three-year project. Less progress was made in the vitamin A education component, and nothing was done in terms of the production of vitamin A-rich foods. One of the most significant outcomes of this effort was the strengthening and expansion of the community outreach activities of the Community Health Department of the Malamulo Hospital. A network of static (made up mostly of fixed mission and tea estate health facilities) and mobile clinics was established and covered almost half of one of Malawi's most densely populated districts. Questions raised concern the rationale for a vitamin A project in an area where very little vitamin A deficiency can be identified, the large amount of unspent funds, the lack of collaboration with the government, and the difficulties that will be faced in sustaining this effort.

IEF - In the first year of a two-year effort, the Vitamin A Project has established a efficient structure that has permitted it to surpass its targets for vitamin A distribution to 80% of the children between 6 and 72 months and postpartum mothers. Through strong collaboration with the government staff in the area, a model for population-based programming has been established. The cornerstone of this operation is the Village Health Promoter and the roster of the members of the target population in the village that she maintains. Less progress has been achieved in the more difficult nutrition education component. Recommendations focus on the strengthening of the education aspect as well as expanding the effort in terms of additional child survival interventions (e.g., immunization, ORT, and even child spacing) and/or greater population coverage. In addition, the possibility is discussed of focusing IEF's follow-up effort on the management of a district-wide, community-based child survival program within the government structure.

I.

ADDA - Vitamin A Delivery Project

ADRA

VITAMIN A DELIVERY PROJECT

A team consisting of the ADRA Malawi Director, the Senior Health Advisor from ADRA Headquarters, the IEF Country Representative and an outside consultant carried out an end-of-project evaluation of the ADRA Vitamin A Delivery Project in Malawi (DAN-0045-G-SS-7110-00) between 8 and 13 October 1990. The grant that funded the project was effective 30 September 1987 and terminated 29 September 1990. The review was guided by the Scope of Work as prepared by ADRA and forwarded to HKI who organized the joint evaluation of the ADRA and IEF operations in Malawi. The Scope of Work is attached as Appendix I.

The evaluation consisted of several steps. In the United States, the project officer in the Office of Nutrition and the officer in the Office of Private and Voluntary Cooperation (PVC) responsible for ADRA projects, both in A.I.D., were contacted to get their impressions of the ADRA project and to determine if they had any special interests or concerns that should be included in the review. In addition, all relevant documents and reports pertaining to the project were reviewed (see Appendix II for a list). Officials at the Malamulo Hospital, especially those at the Community Health Department which was responsible for implementing the Vitamin A Delivery Project, were interviewed as were those connected with the project serving at the field sites the team visited. During the course of the evaluation, a mobile site and several static clinics (one belonging to the Malamulo Hospital, the other being run by an independent group) were visited, giving the team an opportunity to observe project activities being carried out. Appendix III provides the names of those persons with whom the evaluation team met.

A. Background

1. Project Scale-Back

According to the project proposal submitted to A.I.D. by ADRA in April 1987, the objective of the Vitamin A effort was to deliver vitamin A to under six children and lactating women in Thyolo District of southern Malawi. Plans called for approximately half of the district to be covered by the project activities, with emphasis on the poorest areas and those locations with the least access to health/medical facilities. The targeted areas had an estimated population of 210,000 persons¹.

¹ According to the preliminary figures from the 1987 Census, Thyolo District had a population of 431,539.

The proposed project contained a number of interventions aimed at improving the health status of the vulnerable segment of the population in the project area. To begin with, 80% of the lactating women (who were to receive a high dose within three months of delivery²) and children under six (who receive high doses of vitamin A - 200,000 I.U. - twice a year). As a long-term solution to the vitamin A deficiency problem, the promotion of the consumption of vitamin A-rich foods available in the district was to be carried out. This included the development of appropriate teaching materials and use of mass media in a social marketing effort. In addition, the production of fruits and vegetables rich in vitamin A was to be encouraged in home gardens. To assist in this effort community members were to be identified and trained to serve as health care providers in the villages. Community leaders and Traditional Birth Attendants were to play major roles in the project.

The proposal originally submitted by ADRA was for \$273,270 for the three-year period. The Office of Nutrition informed ADRA in late July 1987, that A.I.D. would provide only \$100,000 for the project. The reason for the reduced funding was that the proposal was "not considered to be adequately developed for complete funding"; however, A.I.D. went on to say that "a number of elements in the proposed Vitamin A intervention proposal were well regarded by the review panel." ADRA was requested to modify the proposal to reflect the lower level of funding. While the review panel's comments are summarized in A.I.D.'s letter, no suggestions were given as to how the project might be scaled back in accordance with the almost two-thirds reduction in funding.

The revised version of the Vitamin A Delivery Project was similar in many respects to the original proposal. The principal difference was a reduction in the number of recipients to receive vitamin A supplements: 35% of the target number was to be reached by the end of the first 12 months and 55% by the end of the project.

2. Project Setting

Malawi has one of the worst child health profiles anywhere in the world. It ranks sixth from the bottom in UNICEF's listing in its State of the World's Children 1990.

The Infant Mortality Rate (IMR) in Thyolo District is reported to be 156/1000 live births; 274 out of every 1000 children die before they reach the age of five. Poverty and malnutrition are the norm. According to the 1981-82 National Sample Survey, 53.4% of the under five population was found to be stunted, while 37.1% was under 80% of the standard weight for their age. In 1983, 43% of the children between the ages of 2 and 5 in the district were under the standard weight for their age and 18.5% were severely malnourished (i.e., less than 60% of the standard weight for age). Although more recent

² WHO guidelines suggest that vitamin A supplements should be given to mothers within two months of delivery.

figures on nutritional status in the district are not available, nothing has happened in the interim to lead one to believe that the situation has changed.

The economic profile of Thyolo District explains much of the disastrous child health status. In terms of population density of arable land, Thyolo District is the highest in Malawi (470/square km.). Almost a fifth of the arable land of the district is estate land, mostly tea. The laborers on these estates earn a wage which is barely subsistence. The shortage of land combined with the very low estate wages results in chronic food insecurity. One study in 1989 revealed that 55% of the population survives on one meal a day for the three months prior to harvest (i.e., January to March); 40.5% has only one meal for six months (October through March); nearly 95% has two meals or less for the same six months. In addition, female literacy in the district is only 14.2%.

B. Project Outcomes

If, as A.I.D. stated, the funds were to "be used to further develop ADRA's Vitamin A intervention capabilities for the long term" (Forman, 1987), the Vitamin A Delivery Project can be considered a success. Both ADRA headquarters as well as their operation in Malawi have become familiar with vitamin A programming and have established good working relationships with organizations with specialized expertise in the subject (especially HKI). Equally importantly, the funding provided through the project enabled Malamulo Hospital to strengthen and expand the outreach efforts of its Community Health Department. Vitamin A distribution targets were nearly achieved in the under six target group and exceeded in the postpartum mothers. In addition, the number of village health volunteers trained was nearly five times the target number stated in ADRA's plan.

ADRA articulated four major outcomes in their revised proposal for the Vitamin A Delivery Project - coverage of the target population, training of para-medical and health staff, education of the population on the need to consume vitamin A-rich foods, and the home production of fruits and vegetables containing vitamin A. This section of the report will address the project's effectiveness in each of these areas.

1. Coverage

The population of the part of Thyolo District covered by the ADRA vitamin A project was reported to be 210,000. The target groups consisted of children under six and lactating women. The former was estimated to number approximately 41,000. This number, representing 19.5% of the population, is considered to be reasonable given the high birth rate in the area (although the high IMR might lower it slightly). ADRA stated that it would also reach 20,000 lactating women. Considering that the project was going to distribute one high dose of vitamin A to mothers "immediately after delivery" (defined as up to three months after birth), the target figure ADRA gives is considered excessive. If approximately 5% of the population is pregnant at any given time, it is the same percentage that would receive the vitamin A. This reduces the target number of lactating women to slightly over 10,000.

One way to ascertain if the project reached its coverage targets is to calculate the total number of capsules that should have been distributed over the three-year period. If it is assumed that the project started with 25% coverage in the first six months and reached 35% at the end of the first year and then increased 5% each subsequent half year so that it reached 55% coverage by the end of the third year, the total number of capsules that should have been dispensed comes to 115,000.³ According to the final project report, a total of 100,210 vitamin A capsules were distributed during the course of the ADRA effort; this represents 87.1% of the calculated target.

One explanation for the shortfall is the interruption in vitamin A capsule supplies that the project experienced between April and December 1989. Before the supply of capsules was interrupted, the project had reached as high as almost 5,000 capsules per month. During the period of short supply, the monthly average dropped to 1,500 to 2,000. Previously, ADRA had received their vitamin A supplies directly from the Ministry of Health Medical Stores. For unexplained reasons, the supply stopped, requiring ADRA to procure supplies directly from the producer, Hoffman LaRoche. The nine-month interruption in the middle of the project severely affected its momentum.

Reviewing the disaggregated capsule distribution figures, the evaluation team noted several discrepancies. For one thing, the numbers reported for several distribution sites vary significantly by year. For example, the static clinic at Mbalanguzi reported a 10 fold increase in 1990 over 1989. At the same time, several sites had significantly lower figures in 1990 than they reported in 1989 (e.g., Malamulo had a drop of 50%, Ntambanyama 62%, Nkunda 74%, Milole 84%).

³ The project target number of capsules to be distributed is calculated as follows:

1st six months (@25%) - <6s = 10,250		
	LMS = 1,250	total - 11,500
2nd six months (@35%) - <6s = 14,350		
	LMS = 1,750	total - 16,100
3rd six months (@40%) - <6s = 16,400		
	LMS = 2,000	total - 18,400
4th six months (@45%) - <6s = 18,450		
	LMS = 2,250	total - 20,700
5th six months (@50%) - <6s = 20,500		
	LMS = 2,500	total - 23,000
6th six months (@55%) - <6s = 22,550		
	LMS = 2,750	total - 25,300
	Cumulative Total	115,000

nly half the annual number of lactating mothers are calculated each six months since each woman receives only one capsule. Because the project provided only half a capsule (100,000 I.U.) to children between 6 months and one year, the target number of capsules to be distributed can be reduced lightly.

In addition, some of the monthly figures reported by some of the individual centers also raise questions. One table covering distribution during the first quarter of 1990, shows the Mbalanguzi Clinic distributing 6095 capsules in January. The following month, the same center supposedly distributed another 6084 capsules. While some of the very large January number could be explained by the receipt of fresh supplies after a protracted shortage, there is no reason for this to occur in February as well since the population covered by the clinic is approximately 15,000. In fact, even if 100% of the target population in the clinic's catchment area were given capsules in January, only 3,750 would have been distributed. The project staff could not explain the unusually large number of capsules distributed by the Mbalanguzi Clinic in the first two months of 1990, but were going to check into the matter. In general, while reports were submitted and numbers recorded, there appeared to be little analysis of the figures and what they meant. Moreover, there was no evidence that a target population for each center had been established so that abnormally high figures could be questioned and the level of performance at each could be ascertained and management by exception practiced⁴.

The project managers reported that the number of lactating mothers receiving vitamin A supplements was below the target established in the ADRA proposal. The figures for 1988 and the first half of 1989 did not separate the mothers from the under sixes, making it impossible to determine the project's ability to reach the newly delivered mothers during that period. However, the figures reported for the first nine months of 1990, indicate that, in fact, the project was reaching more than their target number of lactating mothers. From January through September, 4,873 mothers received vitamin A capsules; this is 17% above the target of 55% of the lactating mothers for the same period. One reason that the project thought that it was not achieving its target was the original miscalculation in the number of lactating mothers to be reached as mentioned above.

Despite the apparent success in delivering vitamin A to postpartum mothers, concerns were again raised about several of the numbers appearing in the reports. One case occurs in February 1990, when 486 capsules were reported on one report to be delivered to mothers at all the project sites, while another consolidated report gives the total as 514. Although the discrepancy is small, the lack of accuracy leads one to suspect the validity of all the numbers. A second case is the 176 capsules reported in June 1990 as being distributed to lactating mothers by volunteers in William. One is particularly suspicious when he notes that the exact number of capsules (176) were distributed to children over one in May at the same site. It is possible

⁴ Management by exception can be defined as establishing a norm for performance (e.g., 55% coverage of the target population) and focusing attention on those centers performing significantly below the norm. This allows the program manager to concentrate his energies and limited resources on resolving the problems in the most needy cases. It is also helpful to identify the most successful sites so that their approach can be studied and positive strategies isolated and adopted at the other project sites.

that the same number was recorded for mothers by mistake the following month. But the mistake should have been caught since the average number of mothers receiving vitamin A in William was never more than 30 in any month.

One final point regarding the coverage reached by the ADRA Vitamin A Delivery Project that results from an analysis of the data is the high number of vitamin A capsules distributed as treatment. Project guidelines instructed field personnel to give therapeutic doses of vitamin A to any child suffering from such illnesses as measles, chronic diarrhea, acute respiratory infection and even conjunctivitis. The percentage of the capsules distributed as treatment is significant, averaging 33% of the total each month over the last 15 months of the project. When the capsules distributed for treatment are subtracted from the coverage figures, there is a greater shortfall, and the project is further from its projected targets than originally thought.

The administrative and logistic support provided by ADRA enabled the Vitamin A Delivery Project to achieve its results. In addition to making the necessary arrangements for the supply of the vitamin A capsules when the source in Malawi disappeared, ADRA provided the equipment as originally identified in the Detailed Implementation Plan. Two motorcycles, four bicycles, 10 weighing scales, one typewriter as well as office furniture were procured in an efficient and timely manner.

2. Personnel Training

Considerable attention was devoted to human resource development in the Detailed Implementation Plan that ADRA prepared for the Vitamin A Delivery Project. Malamulo Hospital assumed responsibility for the training of those involved in vitamin A distribution. Regular training sessions were held for medical assistants, nurses and community health workers (or as often referred to village health volunteers) from Malamulo Hospital and participating primary health care units. Separate seminars were conducted for the volunteers and traditional birth attendants serving as volunteers. In addition, information on vitamin A programming was also made available to those medical personnel and students who were from outside the project area and were not directly associated with the ADRA effort. In this way the Vitamin A Delivery Project had an influence well beyond the reaches of the project itself.

Training sessions or seminars were conducted from the beginning of the project. The aspects that were stressed included such things as the functions of vitamin A in the human body, consequences of vitamin A deficiency, Vitamin A Delivery Project objectives and methods by which the project goals and objectives could be reached. Other topics were cooperation with other primary health care units, motivation of community leaders, accurate record keeping, timely completion of reports and evaluation results.

The following seminars were conducted by the Vitamin A Delivery Project:

- July 1988 (116 participants) - HKI held a three-day seminar for medical and nursing staff from health units in Thyolo District as well as students and staff from Malamulo Hospital. Appendix IV provides the agenda for the seminars.

- August 1988 (47 participants) - training session held for community health workers.
- December 1988 (16 participants) - a three-day seminar held for medical assistants and nurses from collaborating clinics in the Thyolo Highlands.
- December 1988 (35 participants) - refresher seminar on vitamin A deficiency, treatment and prevention conducted by the Vitamin A Delivery Project Team to medical assistants and nurses from all over Malawi.
- March 1989 (18 participants) - seminar held for community health workers.
- March 1989 (15 participants) - seminar held at Mbalanguzi for community health workers.
- August 1989 (19 participants) - refresher training session for medical assistants from various Malawian NGOs.
- January 1990 (33 participants) - refresher training for community health volunteers conducted at Mbalanguzi.
- March 1990 (39 participants) - refresher training on vitamin A delivery for community health volunteers.
- September 1990 (15 participants) - refresher course on vitamin A delivery.

No training sessions for community health volunteers were conducted during the latter half of 1989 because of the shortage of vitamin A capsules.

The training of the community health workers or volunteers has been well developed by the Community Health Department at Malamulo Hospital. The program was initiated several years prior to the Vitamin A Delivery Project; approximately 50 had been trained by the time that the Vitamin A Delivery Project began. The training includes such topics as community diagnosis, growth monitoring, malaria, diarrhea, child spacing, malnutrition, personal and environmental hygiene, dysentery, tuberculosis, worm infection, sexually transmitted diseases, blindness, and antenatal care. With the introduction of the Vitamin A Delivery Project, information on the identification of vitamin A deficiency, and its treatment and prevention as well as the purpose of the project were added. The community-based promotion of vitamin A-rich foods was emphasized in the course.

Approximately 150 village volunteers were trained by the project, almost five times the target number specified in the project plan. The Community Health Department trains the community health volunteers in one of two ways.

One is at the Malamulo Hospital itself. Because there are no residential facilities at the hospital able to accommodate such a large number, the volunteers are transported to Malamulo on the morning of training. After the initial two-day intensive training session, the Department attempts to provide a day of training to the volunteers each month to reinforce their knowledge, improve their skills and discuss problems encountered in their respective communities. In total the community health volunteers receive approximately 100 hours of training. A concern was raised by the evaluation team about the large number of topics included in the training. Other community-based primary health care projects have found it most effective to focus on only the most vital topics which will have the greatest impact on reducing infant mortality in the villages. This approach might also be appropriate for Thyolo District. The project trained 80 new volunteers, more than double the 35 that were mentioned in the Detailed Implementation Plan.

Despite attempts by the project managers to involve government health staff in the vitamin A training, they were not successful. Invitations were extended to local Ministry of Health personnel but no one from the government ever attended any of the project-sponsored training sessions.

3. Education

The managers of the Vitamin A Delivery Project appreciated the fact that in the long term the problem of vitamin A deficiency would not be solved by the distribution of high dose vitamin A capsules. To eliminate the need for the supplements, there was a need to educate the population in the project area on vitamin A and how they could improve vitamin A intake in their diets. To this end, each of the medical assistants that went through the project training received a packet of educational materials on vitamin A. The folders were prepared by HKI and included such things as a set of TALC slides on vitamin A deficiency signs, several WHO articles (e.g, the relationship between measles and diarrhea and vitamin A deficiency), and a plasticized four-sided card printed in color and in the local language (Chichewa). This card is the basic guide for the medical assistants as well as the village volunteers in the identification, treatment and prevention of vitamin A deficiency. No social marketing efforts were attempted; the reason given was insufficient funds.

Whether or not the education aspect of the Vitamin A Delivery Project had any impact is impossible to determine. No baseline study was ever carried out to ascertain the knowledge, attitude and practice of the project population in relation to vitamin A and the consumption of vitamin A-rich foods. The reason given for not carrying out a baseline survey was the reduced project budget. However, the Centre for Social Research of Malawi University did conduct a community-based survey for Malamulo Hospital in late 1988; while it contained some information on what vitamin A foods were consumed in the area, there was no data regarding quantities or by whom. In general, from discussions with project health staff and from observing the mothers at distribution sites, the evaluation team determined that the population was aware of the importance of vitamin A at this point thanks to the Vitamin A Delivery Project.

4. Production of Vitamin A-Rich Foods

The Detailed Implementation Plan of the Vitamin A Delivery Project mentioned that efforts would be made to increase the production of vitamin A-rich foods in home gardens. However, no details were provided on how this would be done. One reason given by project managers for not paying more attention to this aspect is the scarcity of arable land in the Thyolo Highlands combined with the rarity of vitamin A deficiency signs in the project area. Moreover, the population in the area already consumes several vegetables containing good quantities of vitamin A like pumpkin, potato and cassava leaves. It is the custom of the local population to mix the leaves mentioned above with a peanut sauce and serve as part of the family meal. The area is also well endowed with fruits such as mango and papaya which are excellent sources of vitamin A. The availability of these vitamin A foods could explain why there is little vitamin A deficiency found in the area.

Despite the generally favorable situation regarding the availability and consumption of vitamin A-rich foods in the project area, the evaluation team thought that simple, low cost efforts could have been made to increase vitamin A availability at the household level, especially among the poorest in the community. Mangoes are available for only a few months a year; while papaya can always be found, it may be beyond the means of those who are living at or below the poverty level. It would not have required much in the way of resources for the Vitamin A Delivery Project to start a papaya seedling distribution program. Households could have been provided two or three seedlings with instructions on how to care for them. It is even possible that the project could have sold the seedlings for several tambalas (a few US cents) and made it a self-sustaining activity. This would have greatly augmented the vitamin A available for the family's consumption. Besides being available for approximately three quarters of the year, the trees need very little attention to thrive. In addition to increasing the availability of vitamin A, it is expected that the papaya seedling distribution activity would have generated considerable community interest in and support for the vitamin A effort as a whole.

C. Project-Related Issues

The evaluation team identified five issues that deserve attention in the hopes of improving future community-based vitamin A projects similar to the Vitamin A Delivery Project. These concerns are the prevalence of vitamin A deficiency in the project area, verification of project coverage figures, lack of reporting guidelines, financial considerations, and collaboration of PVOs carrying out vitamin A projects in Malawi.

1. Vitamin A Deficiency Prevalence

ADRA's Vitamin A Delivery Project proposal reviews vitamin A studies that have been carried out in Africa over the past 40 years - in Nigeria, Kenya, Tanzania. It describes how the connection between measles and severe ocular diseases was made. Studies on blindness and vitamin A deficiency in Malawi

were also summarized. The reader is told that vitamin A deficiency was present in many parts of Malawi, especially in the Shire Valley in the southern part of the country. A 1983 survey conducted in the Shire Valley found almost 4% of the children showed signs of active xerophthalmia, and rates of night blindness and active corneal disease were more than five times the WHO criteria for declaring a significant public health problem. Xerophthalmic corneal scarring was reported to occur at the rate of 5.9/1000, more than 10 times the WHO criteria. All cases of bilateral blindness in the under five age group were considered to be due to vitamin A deficiency. The proposal went on to say that evidence of vitamin A deficiency has also been found in northern and central parts of Malawi. The conclusion was that vitamin A deficiency "was a problem throughout much of the country".

No evidence was presented in the proposal that vitamin A deficiency was a problem in the Thyolo Highlands, the area where the Vitamin A Delivery Project was to be implemented. No baseline or prevalence surveys were conducted during the course of the project. From discussions with project personnel, cases of night blindness and mild forms of xerophthalmia (e.g., Bitot's spot) are very rarely seen in the project area. Because of this, some of the initial training and educational materials on the identification of vitamin A deficiency were less useful. Moreover, a sense of urgency among the community and workers was difficult to stimulate. Finally, one questions the need to launch a major effort to reduce vitamin A deficiency, especially in an area where there is little evidence that it is a serious concern, when there is such a monumental AIDS problem in the area. The rate of HIV positives has gone from 3% to over 25% in the last three years, and 50% of the beds at a local hospital are being occupied currently by AIDS patients.

Despite any reservations that the evaluation team might have had on the need or appropriateness of the Vitamin A Delivery Project, there are several factors which were considered to have made it a worthwhile effort. For one thing, Malamulo Hospital used the project to strengthen and expand its community-based primary health care program. In addition to doubling the number of community health volunteers, the Community Health Department greatly broadened its operations by establishing collaborative arrangements with other facilities and organizations in the area. By the end of the project, 11 static clinics in addition to Malamulo and its satellite clinic, Mbalanguzi, were actively participating in the program. The Hospital was also able to expand the number of mobile clinics from seven to 13, enabling it to reach the most isolated parts of the district.

One of the most important lessons learned in the Vitamin A Delivery Project was the value of the village volunteers. In addition to mobilizing the community for immunization and growth monitoring, the volunteers were found to be invaluable for following up those who did not attend clinic sessions or had special needs (e.g., were severely malnourished). The community health workers had responsibility for a specified number of households (usually 20-25), making it possible for them to maintain a register of the under six children, assuring that they participate in all the health activities at the monthly clinics. Traditional birth attendants were found to be especially productive volunteers because of their close relationship with the mothers in the village. The community workers were particularly effective

in identifying lactating mothers and ensuring that they receive their vitamin A supplements. The Malamulo community health program has experienced only a moderate problem with volunteer drop out, approximately 25% over the last three years. Their relative success in this area is attributed to the non-monetary incentives they provide (e.g., small per diems during training, badges, carry bags) as well as the strong and regular support and supervision they receive from the project staff.

The experience that Malamulo Hospital and ADRA has gained as a result of the Vitamin A Delivery Project will be extremely valuable as ADRA launches its Child Survival Project in the Lower Shire Valley. The Community Health Department at the Hospital will be an excellent source of expertise and experience for the new undertaking.

2. Coverage Verification

The static clinics served those who came to the weekly MCH sessions. The mobile clinics visited the particular site on a predetermined date each month. These facilities provided vitamin A capsules to the under sixes and postpartum mothers who attended. There was no means for the clinic staff to identify those in the community who should have attended, those requiring vitamin A, an immunization or growth monitoring. Only those villages having volunteers had this capability. Hence, the community health volunteers with their registers were able to determine the coverage in their area of responsibility at any point in time.

The registration system is the preferred approach that is being adopted by a growing number of community-based programs around the world. The initial census provides both a baseline and a denominator, thus enabling the program to determine coverage rates as needed. In the absence of a registration system, a project such as ADRA's Vitamin A effort requires some means to determine the level of coverage. One technique that is available and has been utilized in community-based health interventions is the Lot Quality Assurance Sampling (LQAS) methodology. This approach requires very small samples, thus is a quick and inexpensive way to determine if the proposed target (in this case 55%) has been achieved. It is recommended that ADRA investigate this methodology to determine if it is appropriate and could be useful for rural health/Child Survival projects in Malawi and elsewhere around the world. Appendix V is a description of the LQAS methodology.

3. Reporting Guidelines

ADRA, both at headquarters and in the field, expressed some frustration with the way the Vitamin A Delivery Project was administered by A.I.D. To begin with, the results of the expert review of ADRA's Detailed Implementation Plan was never received by the field office in Blantyre. Although the current Senior Health Advisor at ADRA headquarters joined after the project had already been launched, he has never seen or heard about such a review.

Although all correspondence regarding the project has been from and to the Office of Nutrition, there appears to be confusion in ADRA's mind as to who has responsibility in A.I.D. for the project. It seems clear to the

evaluation team that the Office of Nutrition is the responsible party since the project contract was with them and all correspondence regarding the extension was with them.

There was particular concern by the project administrators about the reporting requirements. The data reporting format was unclear throughout most of the life of the project. Originally, the project submitted the regular Child Survival reporting forms. It was only toward the end of the project that they were informed that this was incorrect and were supplied special vitamin A reporting forms. The ADRA administrators felt that it would have been helpful if a briefing on program reporting and financing could have been held early in the process so that any later confusion could have been avoided.

4. Financial Considerations

There were several financial aspects connected with the Vitamin A Delivery Project that raise concern. To begin with, the almost two-thirds reduction in the original project budget had a serious impact on what the project could reasonably be expected to accomplish. While it is understood that A.I.D. had limited vitamin A funds to program, the limitations the reduced funding placed on ADRA and the Community Health Department at Malamulo Hospital must also be appreciated. The greatest impediment resulting from the reduced funding mentioned repeatedly by the project managers was the shortage of housing. The 80% reduction in the budget for staff housing precluded the hiring of additional medical assistants. Housing is in extremely short supply in the project area. Without accommodations it is impossible to recruit and retain medical assistants. The project suffered because it had to do with one medical assistants instead of the three it originally planned.

Another financial aspect that prevents the Vitamin A Delivery Project from continuing its work and assuring sustainability is the inability of A.I.D. to approve a no-cost extension⁵. ADRA had been under the impression that there would be no problem in being granted an extension. This had become a common practice in Child Survival projects. Moreover, the contract signed in 1987 referred to "the estimated completion date of September 29, 1990." In February 1990, an internal ADRA memo mentioned that they had been advised that in order to be granted a two-year extension, the Vitamin A Delivery Project would require a mid-term evaluation. On 30 April 1990, ADRA made its formal written request to the Office of Nutrition for the two-year, no-cost extension. It was at this point that ADRA was informed that this would not be possible.

The lack of an extension has resulted in the project being left with considerable unspent funds. As of the final accounting, only \$27,274 (or 37.5%) of the field budget of \$72,695 has been expended. It is unknown at this time what proportion of the \$27,305 budgeted to cover ADRA home office expenses or \$33,000 that was to be contributed by ADRA were spent.

⁵ The Vitamin A Set Aside funds were allocated by Congress in 1985 with the provision that they be fully expended within a five-year period.

In order to prevent such a large amount of money being unprogrammed in the future, several things might be done. First, ADRA should develop and introduce a project expenditure tracking system. Such a system would give the project manager a monthly accounting of what had been spent by line item compared to the budgeted amount as well as the percentage that should have been expended by this time in the project. Secondly, ADRA must determine at the very beginning of the project whether or not the project can be considered for an extension.

5. Collaboration

Throughout the course of the Vitamin A Delivery Project, there has been a high level of collaboration with other PVOs at the international, national and local levels. The project received technical assistance and help in the initial training from HKI. This enabled them to gain a strong foundation in vitamin A programming which they in turn transferred to the rest of the project staff. HKI also provided the materials which served as the basis of the project's educational effort.

Another opportunity for collaboration on the international level presents itself in the form of the Collaborative Network for Vegetable Research and Development in the Southern African Region (CONVERDS). Malawi will be one of the countries included in this effort that will be carried out in conjunction with the highly respected Asian Vegetable Research and Development Center (AVRDC). This is a potentially important resource for ADRA's forthcoming Child Survival project in the Lower Shire Valley.⁶

Nationally, the project established a close working relationship with the IEF and Save the Children (US). Training sessions and resources were shared with the other organizations. In addition, IEF's technical expertise was taken advantage of several times during the project. This joint evaluation with ADRA and IEF sharing an outside consultant and participating in the review of each others projects is an efficient as well as useful strategy. Because ADRA's vitamin A project did little in the vegetable production aspect, the possibility never arose of them collaborating with Save the Children's successful home gardening activity in northern Malawi (at Mbalachanda). This effort has led to an increase in the local consumption of vitamin A-rich vegetables and a surplus for which the project is currently trying to find a market or a way to preserve.

While the collaboration to date among the American PVOs has been positive, it can be described as ad hoc. As additional PVOs (e.g., World Vision, HOPE which will soon begin child spacing activities in Thyolo District) become involved in Child Survival programming in Malawi, it is

⁶ Unfortunately, the report outlining what CONVERDS will do in the respective countries identifies cabbage as the crop to be developed in Malawi. However, it also mentions that post-harvest technology will be one of the areas to be investigated; it is possible that research could be carried out to identify inexpensive technologies and techniques for preserving surplus fruits and vegetables.

increasingly important that they collaborate in a more organized and systematic manner. It is suggested that a formal organization be formed in which the PVOs implementing Child Survival projects would meet regularly to exchange ideas and experiences. This would provide a forum in which innovative techniques and approaches could be shared.

At the local level, in Thyolo District, the Vitamin A Delivery Project provided the need as well as the means for the Community Health Department of the Malamulo Hospital to established a good working relationship with a number of mission and estate health facilities. Including them in the project has help the hospital achieve its objectives. It is hoped that the relations established during the vitamin A project will continue in the future and that ways will be found for the hospital to maintain the supply of vitamin A capsules to these neighboring centers so that the supplements for the vulnerable members of the population can continue.

6. Sustainability

Vitamin A distribution will continue in the community-based primary health care program that Malamulo Hospital operates. Thus, in addition to the static facilities at the Hospital itself and at Mbalanguzi, vitamin A programming is expected to be an integral part of the mobile clinics which the Community Health Department will be carrying out in Thyolo District in the years ahead. The size of the population covered by the outreach approach will depend on financial resources available to the Hospital and the Community Health Department.

Several of the collaborating static clinics belonging to other organizations in the area that are convenient to the Hospital will continue to be supplied with vitamin A capsules by Malamulo and, therefore, will be able to maintain their vitamin A distribution. Those centers which are not convenient and require long diversions by Department staff to deliver the capsules will have to be dropped due to lack of funds to cover the transport costs. It is possible that if the Vitamin A Delivery Project had collaborated with the District Health structure, vitamin A programming could have become a regular part of its operations and be included as one of the interventions they deliver in their mobile clinics. The benefit of working more closely with the government health services, assisting them to develop their institutional capabilities, should be considered by ADRA and Malamulo Hospital in any future Child Survival activities they might carry out in Malawi.

D. RECOMMENDATIONS

Based on what has been learned in the review of the Vitamin A Delivery Project, the evaluation team has identified a series of recommendations that ADRA should take into consideration when implementing their Child Survival project in the Lower Shire Valley. They are:

1. Population-Based Programming: All ADRA outreach programming efforts functioning at the community level (i.e, having village volunteers)

should be population-based, meaning that they should utilize registers which include all target group members in the villages that are part of the project. As demonstrated in the Vitamin A Delivery Project and a number of other Child Survival efforts elsewhere, such an approach is the most effective way to follow-up on drop-outs and those "at risk" and to track accurately project performance on an on-going basis.

2. Limited/Targeted Interventions: Future ADRA Child Survival efforts should be limited to those interventions which will have the greatest impact on improving the health status of the target population and reducing infant/child mortality in the project area. In order not to dilute the effort, no more than three to four priority interventions should be included (e.g., immunization, ORT, child spacing and vitamin A).
3. Innovative Health/Nutrition Education: ADRA should procure technical assistance to help them develop an institutional capacity to design and implement social marketing efforts in support of their Child Survival initiatives. This approach includes such useful techniques as formative research, message development, message testing and impact assessment. Greatest effectiveness in changing behavioral patterns has been associated with a limited number of messages which are frequently repeated and reinforced by both multi media as well as interpersonally.
4. Development and Use of an MIS: ADRA should give greater thought to the development and use of the Management Information System that will support its Child Survival efforts in the future. Program managers must be trained and monitored in the use of MIS-produced data for purposes of project management.
5. Benchmark Survey: In the initial phase of a Child Survival effort, ADRA should ensure that they have data reflecting the status of the target population prior to the initiation of project interventions. Data should only be collected on those key indicators which are linked directly to project objectives and which will be tracked throughout the course of the project. It is possible that the benchmark survey can be derived from the first census/registration exercise, thus eliminating a separate time-consuming and expensive data collection effort.
6. Vitamin A-Rich Food Production: In any project having a vitamin A component, ADRA should make a concerted effort to identify a limited number of local crops which are widely consumed in the area and are easy to produce that can be promoted as a long-term solution to the vitamin A problem. Focusing on one or two crops is preferable to a garden approach which has proved difficult for community members to adopt. The more that can be done to provide community members with seeds/seedlings of these selected crops (possibly on a cost recovery basis), the greater the success that can be expected.
7. Financial Tracking: ADRA should develop a financial tracking system which keeps project managers informed on a monthly basis about project expenditures to date. The cumulative expenditures should be compared to

the amount that was originally budgeted, calculating the percentage of the line item that should have been expended by the particular point in the project and the percentage that has been spent. This will enable the manager to determine the overall financial status of the project as well as to identify line items which have been greatly over or under spent.

8. Greater Interaction with Government: In order to develop the capabilities of the government health services and in order to improve the chances of sustainability, ADRA should establish a closer working relationship with the public health facilities and personnel in their Child Survival project area.
9. Collaboration with Other PVOs: ADRA should establish contacts with other U.S. PVOs involved in Child Survival programming in Malawi to promote the sharing of experiences and approaches. In addition, ADRA should also work closely with all other groups that have health-related operations in or close to the area in which ADRA is carrying out Child Survival interventions to ensure there is no overlap and to integrate activities as much as possible.

**SCOPE OF WORK FOR END OF PROJECT EVALUATION
MALAWI VITAMIN A**

PURPOSE OF EVALUATION

Purposes of the evaluation include:

1. To assess the degree to which the project objectives were achieved.
2. To assess the implementation process.
3. To assess ADRA's ability to plan and implement Vitamin A projects.
4. To identify constraints, both internal and external to the project that have impeded effective implementation and lessons learned.
5. To derive recommendations based on the lessons learned for consideration of future Vitamin A/Child Survival involvement.

EVALUATION SCOPE OF WORK

Preparatory Work: (1 day)

1. Review of documents relevant to project
2. Draft of preliminary chronology of the project
3. Identification of issues affecting implementation
4. Identification of indicators of project success
5. Preliminary design of investigation protocol
6. Clarify approach, roles and schedule of evaluation with in-country staff
7. Prepare interview and observation guides, number of interviewees or observations, and team assignments

Field Work: (2 - 3 days)

1. Conduct interviews and observations
2. Check perceptions with field staff and management
3. Review information and issues
4. Discuss lessons learned
5. Develop recommendations based on the lessons learned

Reporting: (1 - 2 days)

1. Write a draft report summarizing the evaluation and findings
2. Debrief field project management and other stakeholders
3. Due date for the final evaluation report is due two weeks after leaving the field.
4. Provide a copy of the report to ADRA, IEF and HKI. (This report will serve as the basis for the EOP final report for USAID.)

Methods and Procedures:

ADRA/I estimates that the final evaluation of ADRA/Malawi's Vitamin A project will take 5 days, including 1 day for reporting writing and 1 day for debriefings.

The team consists of an independent evaluator who will be responsible for the final report, 1 ADRA/Malawi staffmember working with the vitamin A project, 1 ADRA/HQ representative and 1 IEF representative.

APPENDIX II

DOCUMENTS/REPORTS REVIEWED

- ADRA, Interim Report, Vitamin A (September 1987-August 1989), (Silver Spring, MD.: October 1989).
- ADRA, Malawi Vitamin A Delivery Project - Detailed Implementation Plan, (Silver Spring, MD.: June 1988).
- ADRA/Malawi, Malawi Vitamin A Country Plan, (Malamulo Hospital, 1987).
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- Sheffield, V.M., Trip Report - Lilongwe, Malawi (12-30 March 1988), (New York: HKI, April 1988).
- UNICEF, State of the World's Children 1990, (New York: Oxford Press, 1990).

APPENDIX III

PERSONS CONTACTED

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Deputy, PVC Office

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William Hayton
Gilbert Burnham

Head, Community Health Department
OB/GYN, Advisor on Community Health
Director

Nkusa Mobile Clinic

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Mrs. H. Detani
Mrs. Mpwensiwa

Medical Assistant
Nurse
Homecraft Worker

Molere Clinic

Ms. Bertha Chigona

Nurse

Mbalanguzi Clinic

Winston Chikopa

Medical Assistant

APPENDIX IV

VITAMIN A SEMINAR
PROGRAM MANAGERS/SUPERVISORS

AGENDA
19 July 1988

0830	Introduction	A. Ralte
0845	Overview of Vitamin A Ocular signs/symptoms of Vitamin A Deficiency Criteria for Assessing Public Health Importance (WHO standard) Treatment and Prevention Protocol	V. Sheffield
1015	Coffee break	
1030	Vitamin A and Child Survival Linkage	A. Ralte
1100	Open discussion	
1115	Video "20/20: A Gift of Sight, A Gift of Life"	
1200	Lunch	
1330	Program Strategies	A. Ralte
1400	Emergencies Nutrition Education/ Social Marketing	V. Sheffield
1500	Coffee break	
1515	Assessment, Monitoring, Evaluation	A. Ralte
1600	Open discussion	
1630	End of session	

VITAMIN A SEMINAR
MEDICAL STUDENTS

AGENDA
20 July 1988

0800	Introduction	Dr. Burnham A. Ralte
0815	Overview of Vitamin A Ocular signs/symptoms Criteria for Assessing Public Health Importance Treatment and Prevention Protocol	V. Sheffield
0930	Vitamin A and Child Survival Linkage	A. Ralte
1000	Program Strategies	A. Ralte
1045	Coffee break	
1100	Nutrition Education/Training	V. Sheffield
1130	Emergencies	V. Sheffield
1200	Evaluation of session	Participants
1215	End of session	

VITAMIN A SEMINAR
MEDICAL STUDENTS

AGENDA
20 July 1988

1600	Introduction	A. Ralte
1605	Overview of Vitamin A Ocular signs/symptoms of Vitamin A Deficiency Criteria for Assessing Public Health Importance Treatment and Prevention Protocol	V. Sheffield
1705	Vitamin A and Child Survival Linkage	A. Ralte
1715	Nutrition Education/Training	V. Sheffield
1750	Evaluation of session	Participants
1800	End of session	

VITAMIN A SEMINAR
SENIOR MEDICAL ASSISTANTS/MEDICAL ASSISTANTS/
NURSES/MIDWIVES

AGENDA
21 July 1988

0900	Introduction	Dr. Panulo A. Ralte
0915	Overview of Vitamin A Ocular signs/symptoms of Vitamin A Deficiency Criteria for Assessing Public Health Importance (WHO) Treatment and Prevention Protocol	V. Sheffield
1015	Coffee break	
1030	Vitamin A and Child Survival Linkage	A. Ralte
1045	Program Strategies Group discussion: Integration to Ongoing Child Survival Activities	A. Ralte
1145	Video "20/20: A Gift of Sight, A Gift of Life"	
1230	Lunch	
1400	Nutrition Education/ Social Marketing	V. Sheffield
1430	Assessment, Monitoring, Evaluation	A. Ralte
1500	Coffee break	
1515	Emergency Situations Examples from Ethiopia/Sudan	V. Sheffield
1530	Open discussion	
1545	Evaluation of session	Participants
1600	End of session	

QUALITY CONTROL
OF PRIMARY HEALTH CARE
IN COSTA RICA

PRICOR

Primary Health Care Operations Research

**Center for Human Services
5530 Wisconsin Avenue
Chevy Chase, Maryland 20815.**

FINAL REPORT

**QUALITY CONTROL
OF PRIMARY HEALTH CARE
IN COSTA RICA**

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Lic. Silvia Boada Martinez
Harvard Institute for
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Ministry of Health of Costa Rica

Collaborating Institutions:¹

Ministry of Health of Costa Rica
Harvard Institute for International Development
Pan American Health Organization
PRICOR (Under a Cooperative Subagreement from the Office of
Health, Bureau for Science and Technology,
Agency for International Development)
National Research Council/Ford Fellowship
BOSTID (CRG Grant No. RGA-CR-1-87-71).

May 7, 1988

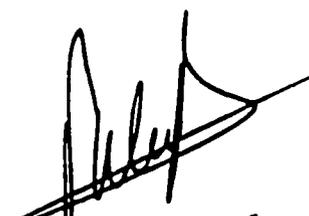
¹Very special recognition is given to Dr. Carlos Valerin, (Director General of Health), Dr. Hugo Villegas, (National Representative for PAHO), Dr. Carlos Ferrero, (PAHO Regional Advisor in Health Information Systems), Dr. John Wyon (Harvard School of Public Health), and Dr. Donald Shepard (Harvard Institute for International Development), without whose support and creativity this project would not have been possible. We give our thanks to INISA and to all other individuals in the Costa Rica Health System who worked in the project.

The Ministry of Health has stated a group of policies and strategies for health. The General Director of Health is putting them into operation. The process of technical - and administrative decentralization has been completed - the stages of basic data for the diagnostic of the health - attention and the processes of programming, management and control.

This document is a report on the project on Quality - Control of the health services applied to Primary Health - Care. It was prepared by th Ministry of Health in Costa - Rica and the Institute for International Development of Harvard University, with the previous agreement of PRICOR.

A group of professional were involved in this project and they have invested a lot of time and efforts. We - sincerely apreciate what was done by all of them and we - expect that this effort will allow a better local of health for Costa Rica and other countries of the world.

Very truly yours,


Dr. Carlos E. Valerín Arias
GENERAL DIRECTOR OF HEALTH
MINISTRY OF HEALTH
COSTA RICA





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In 1975 the Harvard Institute for International Development (HIID), whose goal is to strengthen the participation of the University in projects overseas, committed itself to improving the health systems of developing countries. Dr. Derek Bok, the President of Harvard, is a strong supporter of the efforts of HIID to develop an active Latin American and Caribbean Health Program. The main goal of HIID's Health Program in Latin America and the Caribbean, and throughout the Third World, is to help develop national health care systems, and thereby improve the health of the populations in need of better health care.

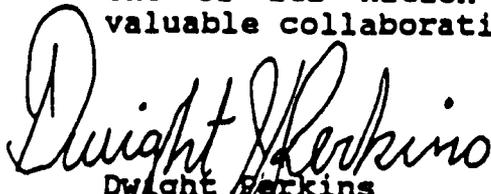
The initial stage of the project, "Quality Control of Primary Health Care in Costa Rica", which is presented in this document, reflects our interest in designing and applying quantitative methods which will enable the authorities of Costa Rica to identify the existing problems in health care delivery at the regional level.

The sampling method used in this project, Lot Quality Assurance Sampling (LQAS), has proven to be both innovative and valuable for assessing the quality of basic services provided by the Primary Health Care system to the Costa Rican population.

The second phase of the project is currently underway in Costa Rica. Its goal is to identify possible causes of the problems identified during phase one. For example, the quality of services with respect to measles vaccination will be analyzed, and solutions will be designed and implemented to address the problems identified.

Not only will Costa Rica benefit as a result of this project, but other countries who are interested in applying LQAS methodology will also benefit.

I would like to sincerely thank the Ministry of Health of Costa Rica for its support of this project. In addition, I would like to express my gratitude both to PRICOR for subcontracting one of its nation studies to HIID, and to PAHO/WHO for its valuable collaboration.


Dwight Perkins
Director

PREFACE

Over the past decade, national and international commitment to extending basic health services to underserved urban and rural populations in developing countries has led to major investment in primary health care (PHC) and child survival program strategies. However, these programs continue to face persistent problems with underutilization of services, lack of knowledge and acceptance of home-based interventions, and at times, inadequate quality of services provided. Typically, program managers lack specific information about how service delivery activities and support functions such as supervision, are routinely carried out.

While surveys and evaluations have tended to focus on measuring program inputs (such as training and supplies), outputs (such as number of services delivered) and impacts (such as changes in morbidity rates), relatively little attention has been devoted to analyzing the performance of the activities that produce a given outcome. Yet, opportunities to improve the effectiveness of PHC and child survival programs at the operational level clearly depend on strengthening these service delivery and support processes.

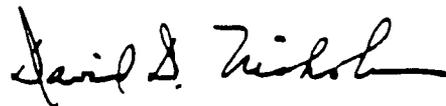
Responding to the need for better information on the process of service delivery, the Agency for International Development has launched, through the Primary Health Care Operations Research Project (PRICOR) Project, a major international effort to document and analyze the activities of PHC programs in developing countries. PRICOR was established in 1981 under a cooperative agreement with the AID Office of Health to help developing countries improve their PHC and child survival programs through practical, decision-oriented management studies and operations research. In its second phase, a major PRICOR objective is to develop new and innovative ways of identifying and diagnosing discrete problems in the process of service delivery that will lead to measurable improvements in program performance.

PRICOR staff now are refining and applying a systems analysis approach that allows program managers to accurately describe how key components of the PHC program actually operate and to identify the specific weak points and bottlenecks that impede effective delivery of PHC services at the peripheral level. The systems analysis relies on direct observations, key informant interviews, limited surveys, and other rapid assessment methods to provide decisionmakers with a comprehensive picture of program strengths and failures. By shifting the focus from input and outcome measures to process indicators, systems analysis provides concrete data that lead to tangible improvements, through immediate corrective action or short, problem-solving studies.

The PRICOR Country Report series presents the efforts of PRICOR staff and investigators from collaborating institutions to apply in some dozen countries practical methodologies for observing and measuring how PHC service delivery activities are being carried out. This volume presents a PRICOR country study conducted in Costa Rica by the Harvard Institute for International Development which adapted the industrial sampling technique of Lot Quality Acceptance Sampling (LQAS) for use in identifying substandard service delivery performance in health posts.

LQAS is an innovative way of identifying problems in the delivery of basic health services in developing countries. Given the complexity of primary health care systems, it is very difficult to identify weak or problematic areas where systems analysis can be focused. PRICOR views LQAS as a useful screening tool for identifying problematic health posts and service delivery components to which a more in-depth systems analysis methodology can be applied to pinpoint the causes of inadequate performance.

As is true for all analytical methods, sampling is a major concern in the application of systems analysis. A quick statistically sound method for collecting information is needed. Since LQAS uses a relatively small sample size, PRICOR has supported the testing of the LQAS methodology as one possible solution to the sampling problems in systems analysis. The use of LQAS is a potentially valuable method by which the systems analysis process can be shortened and made more efficient.



David D. Nicholas, M.D., M.P.H.
Director
PRICOR Project

TABLE OF CONTENTS

INTRODUCTION	1
SAMPLING FRAME	4
PREPARATION AND UPDATE OF THE MAPS	5
SELECTION OF INTERVIEWERS	6
COMPILATION OF INFORMATION	7
QUALITY CONTROL TEAM	8
RESULTS	10
HOME VISITS	10
VACCINATIONS	12
I. Screening Health Facilities According to Ministry of Health Standards	12
First Polio and DPT Doses	12
Second and Third Polio and DPT Doses:	15
Measle:	15
II. Evaluation of Vaccination According to WHO Atandards:	16
REFERRAL OF PREGNANCIES	17
REFERRAL OF NEWBORNS	17
ORAL REHYDRATION THERAPY	18
ANNEXES	20
ANNEX 1 OPERATING CHARACTERISTIC CURVE	21
ANNEX 2 PROBABILITIES FOR A SAMPLE = 28.	22
ANNEX 3 TABLE 1: COVERAGE AT THE REGIONAL AND NATIONAL LEVEL	23
ANNEX 4 LIST OF HEALTH FACILITIES BY TOTAL NUMBER OF SERVICES FOUND TO BE DEFECTIVE: 1987	38
ANNEX 5 LIST OF HEALTH FACILITIES CLASSIFIED AS HAVING ACCEPTABLE OR DEFECTIVE POLIO VACCINATIONS: 1987	40
ANNEX 6 LQAS PROJECT: PRIMARY HEALTH CARE QUALITY CONTROL MINISTRY OF HEALTH HARVARD UNIVERSITY (HIID) LIST OF DEFECTS FOR EACH HEALTH FACILITY IN 28 OBSERVATIONS OF POLIO VACCINATIONS 1987	56
ANNEX 7 LQAS PROJECT: PRIMARY HEALTH CARE QUALITY CONTROL MINISTRY OF HEALTH, HARVARD UNIVERSITY (HIID) LIST OF DEFECTS FOR EACH HEALTH FACILITY IN 28 OBSERVATIONS OF POLIO VACCINATIONS: 1987	74

ANNEX 8	PROCESSING THE DATA	93
	COMPUTER PROGRAMS RUN	94
	D.B.F. FILES	96
	F.R.M. REPORTS	98
ANNEX 9	INSTRUMENTS USED	101
	INFORMATION SOURCES MOST USED	101
ANNEX 10	Calculating Coverage Proportions and Confidence Intervals with LQAS Data	102
ANNEX 11	A Hypothetical Application of LQAS	104

INTRODUCTION ²

Aside from the known decline in infant mortality, morbidity, and disease following the establishment in 1972 of the Primary Health Care program began in Costa Rica, there has never been a systematic assessment of the quality of the services offered to the country nor a check into whether or not these services have been executed both correctly and within the proper time frames.

As the Ministry of Health (MOH) is aware that an inspection of the quality of health care services should help bring about a more efficient and effective use of available resources, the MOH decided to develop this present project in collaboration with the Harvard Institute for International Development (HIID), and the Pan American Health Organization under a Cooperative Agreement with PRICOR.

The essential purpose of this project is to evaluate the Primary Health Care Program at the most decentralized level of organization, namely, health areas, while testing a new rapid method of health facility evaluation: Lot Quality Assurance Sampling (LQAS). The data collected in the project was intended to detect whether or not Health Areas (HA) were performing up to the standards of the MOH and the World Health Organization (WHO) and to permit the calculation of precise coverage proportions both at the national and regional levels of organization.

² The work upon which this presentation is based was performed in part under a subagreement with the Center for Human Services under its Cooperative Agreement No. DPE-5920-00-A-5056-00 with the U.S. Agency for International Development.

LQAS should be contrasted with the EPI cluster sampling method of evaluation presently used by the Extended Immunization Program (EPI) of WHO which can be used to determine coverage at either national or regional levels. LQAS is able to systematically determine the quality of services offered in each and every peripheral administrative unit or HA and at every progressively more centralized level of organization. It is important to note that whereas LQAS requires small samples (in this project $n=28$) EPI cluster sampling requires samples of 210.

Another advantage of LQAS is that the same information used to measure coverage can also be used to evaluate the quality of health records in the HA's.

In specific terms, the goal of the project was to classify 60 of 700 HA's throughout Costa Rica according to their quality of health service coverage by the following services: delivery of the complete series of polio, DPT, and measles vaccinations; competent use of oral rehydration therapy; referrals of pregnant women and new borns to doctors; and, home visits by community health workers (CHW) in each of the Primary Care Areas selected. Adequate coverage was assumed to be 80% or better; the lowest quality coverage was assumed to be 50% or less. LQAS has been designed as a rapid assessment technique that classifies health areas with the lowest coverage (i.e., $\leq 50\%$) from those areas with excellent coverage (i.e., $\geq 80\%$). Thus, areas in which the population is under the greatest risk can be identified for a concerted investment aimed at improving services and reducing health risk. Correspondingly, HAs with high levels of coverage also need to

identified in order to avoid unnecessary investment into HAs that do not need it. The areas with coverage levels between 50% and 80% are neither adequate nor the highest priority for improvement. Accordingly, the closer an HA is to either 50% or 80%, the greater the likelihood that it will be classified as substandard or adequate, respectively. In this study with a sample of 28, there is only a 5% chance that HAs with coverage $\leq 50\%$ or $\geq 80\%$ will be misclassified. This level of error is obtained using the following decision rule. An HA is classified as below standard if more than 9 of 28 children have inadequate coverage for a given activity. See Annex 11 for a discussion of Lot Quality Acceptance Sampling.

The results of this project will allow for the identification of any of the services that are problematic in each HA and the portions of the regional and national populations affected by these problems.

The names of each HA are arranged in Annex 4 according to Health Center and region, and their status as either acceptable or deficient for each service examined.³ The coverage proportion for each Primary Health Care service in all 60 HAs and their respective confidence intervals are listed in Table 1.⁴

³Health Areas (HAs) are administered by Health Centers (HCs). Each HC is responsible for administration of about 9 HAs. HCs are administered by Health Regions who in turn are administered by the MOH from San Jose.

⁴During 1988, a set of deficient Areas will be diagnosed in order to identify the causes of the substandard service delivery. At that time, a plan of action will be implemented in an attempt to eliminate these problems. During the life of the project the changes to the HAs will also be evaluated to determine whether improved service delivery occurred.

The project randomly selected a sample of 28 children under 3 years of age from each of the 60 HAs. Although this sample size is larger than the number which we expect to be used regularly by the Costa Rican National Primary Care system, it was selected for this first test of LQAS since both Type I and Type II classification errors were less than 5%. In total, 1680 children from 39 rural and 21 urban Areas from the 6 different regions of the country were randomly selected to be studied (See Annex 1 for the Operating Characteristic Curve applicable to this sampling design).

The number of HAs selected to be studied was determined by the budgetary limits of the project. Nevertheless, the project's measure of coverage by each PHC Service at both national and regional levels yield small confidence intervals ($\pm 2\%$) thus indicating their precision.

SAMPLING FRAME

Copies of maps from the most recent census, 1984, were used as the project's sampling frame. This decision was made for two reasons:

- 1) The majority of the hand drawn maps normally made by HAs were out-of-date and, therefore, it was highly probable that many families in target HAs would not be listed in them. Thus, these maps were eliminated from the study.
- 2) The project's sampling frame had to be independent of the health system since the study was intended to evaluate the health information system, and determine the proportion of families that had been identified by each HA's health worker.

PREPARATION AND UPDATE OF THE MAPS

A team consisting of a map maker and a permanent member of the project staff visited each of the 60 HAs and, with the help of the CHW delineated the portion of the map produced by the 1984 census which represented his/her HA. The boundaries of these catchment areas were assessed for face validity by supervisors. The team then updated the maps to ensure that all families (to the extent possible) were included in the maps. A combination of supplemental information sources were used. Firstly, the hand drawn maps found in each HA were used since CHWs may have located houses that escaped census takers. Secondly, CHWs were interviewed since houses they located were not always transferred to their own maps. Thirdly, the project team reconnoitered the project area to visually validate the map. New houses were added as necessary. On one occasion, a map produced by the malaria campaign near the Nicaraguan border was used.

After the maps were updated, they were organized into a sampling frame in the following manner.

- 1) Each house in a given Area was assigned a unique number.
- 2) The total number of houses in each Area was divided by 28 (the size of the sample) in order to obtain the sampling interval. To identify the first house to visit, a number between 1 and the sampling interval was randomly chosen. The subsequent 27 sampling points were selected by adding the number of the house just sampled to the sampling interval. For example, if the first sample point is house 5 and the interval is 10, then

the second sampling point was house 15, the third house 25 and so forth.

- 3) Arrows were drawn on the maps to designate the direction in which an interviewer should go in the case that there were no children under three years of age found in one of the indicated houses. The average number of houses visited by a given interviewer before finding a child under the age of 3 was 3 houses.

SELECTION OF INTERVIEWERS

Three interview teams were organized for collection of the IQAS data. Each group consisted of three interviewers, a supervisor and a chauffeur (5 people to a group). The selection of the interviewers and supervisors was made in the following manner:

- 1) For two days, the project advertized the job of interviewer in the national newspaper with the largest circulation. Interested individuals were requested to call a telephone number.
- 2) During two days, 40 candidates were shortlisted from the telephone calls for a personal interview. Eligible candidates were experienced interviewers who had used maps in the field, had completed college, and were available for extended periods of work outside of the Capital of San Jose for as much as two weeks at a time.
- 3) From the 40 candidates interviewed personally, 20 were selected for training.

- 4) The 20 candidates selected were trained by the project staff in interviewing techniques and in the preferred manner to use the LQAS questionnaire. The form and function of the Primary Health Care Program was explained briefly ⁵ and the documents which they would need to consult while in the field, such as the family health records, the vaccination notebooks, the household registers, the individual control cards, control cards for pregnancies, and other such items, were shown and explained to them.
- 5) At the end of the training course, the candidates were given both a practical and a written exam to select the 12 strongest candidates. These 12 were organized into 9 interviewers, and 3 supervisors; 2 substitutes were also identified.

COMPILATION OF INFORMATION

Each group of interviewers was given a set of updated maps (at regular intervals), a set of questionnaires⁶, assigned a vehicle and a chauffeur, and sent to the appropriate HAS to conduct the LQAS sample. Following the arrows marked out on the maps, the home to be interviewed was located. If no children under the age of three were found in any one of the indicated houses, the interviewer proceeded to follow the

⁵ The history and function of the Primary Health Care System were explained to the interviewers so they would be able to understand the crucial role of their work in the development of the PHC system.

⁶ Questionnaires were pre-tested and revised many times before being used. All pretesting occurred in marginal areas of San Jose.

direction indicated by the arrows on the map until a household with a child in the proper age range was located. At least 10% of all houses were revisited by supervisors to determine whether this procedure was being followed correctly. No discrepancies were found.

After the mothers of the children in each of the 28 households of an Area were interviewed, the questionnaires were taken to the archives of that Area in order to verify the data collected. Such a verification was implicit in the design of the questionnaire in order that the degree of correspondence between the experiences of families in households and the records of these experiences in HAs could be determined.

QUALITY CONTROL TEAM

In order to determine the reliability of the data, a quality control team was formed. Using the same questionnaire, the team reinterviewed 10% of the mothers previously interviewed. Therefore, 3 mothers from each of the 60 Areas were reinterviewed.

Mothers to be reinterviewed were identified by randomly selecting three questionnaires from each lot of 28. For example: the 28 questionnaires for each HA were numbered consecutively. Next, if 10 interviews were performed by one interviewer, a random number was taken between 1 and 10. The same procedure was followed to select one questionnaire from each of the other two interviewers.

After the three interviews were selected, the corresponding mothers were reinterviewed. Their responses were also checked in the HA's archives. Subsequently, a measure of quality was made consisting of:

the number of responses that coincided between the original and second interview as a numerator and the total number of questions as a denominator.

In order to perform these quality control calculations, the questions were organized into five categories: empirical, subjective, those which classified HAs as either acceptable or deficient, all interview questions, and those which were used to verify the quality of the health information system.⁷ Using a very simple formula (number of responses verified divided by number of questions), the quality of each of the interviews was determined. Results of 90% were considered acceptable.⁸

When the quality was less than 90%, the supervisor of the appropriate interview team was notified and shown the problem questions. They were instructed to contact the appropriate interviewer and explain the error. The goal was to prevent the same error from being committed in subsequent interviews. Some 11 HAs exhibited data quality scores less than 90%, thus, requiring the quality control group to return to these 11 Areas to collect a second time the appropriate category of data. In all cases the faulty data consisted of those

⁷Empirical questions depended on observable facts; subjective questions relied on either the opinions or memories of mothers.

⁸ The data obtained for the weight and height of the children was of such a low quality that it was excluded from the study. Mothers tended not to remember when their children were weighed and measured, and CHWs tended not to record the dates they performed these activities.

59

FIGURE 1A

Group 1

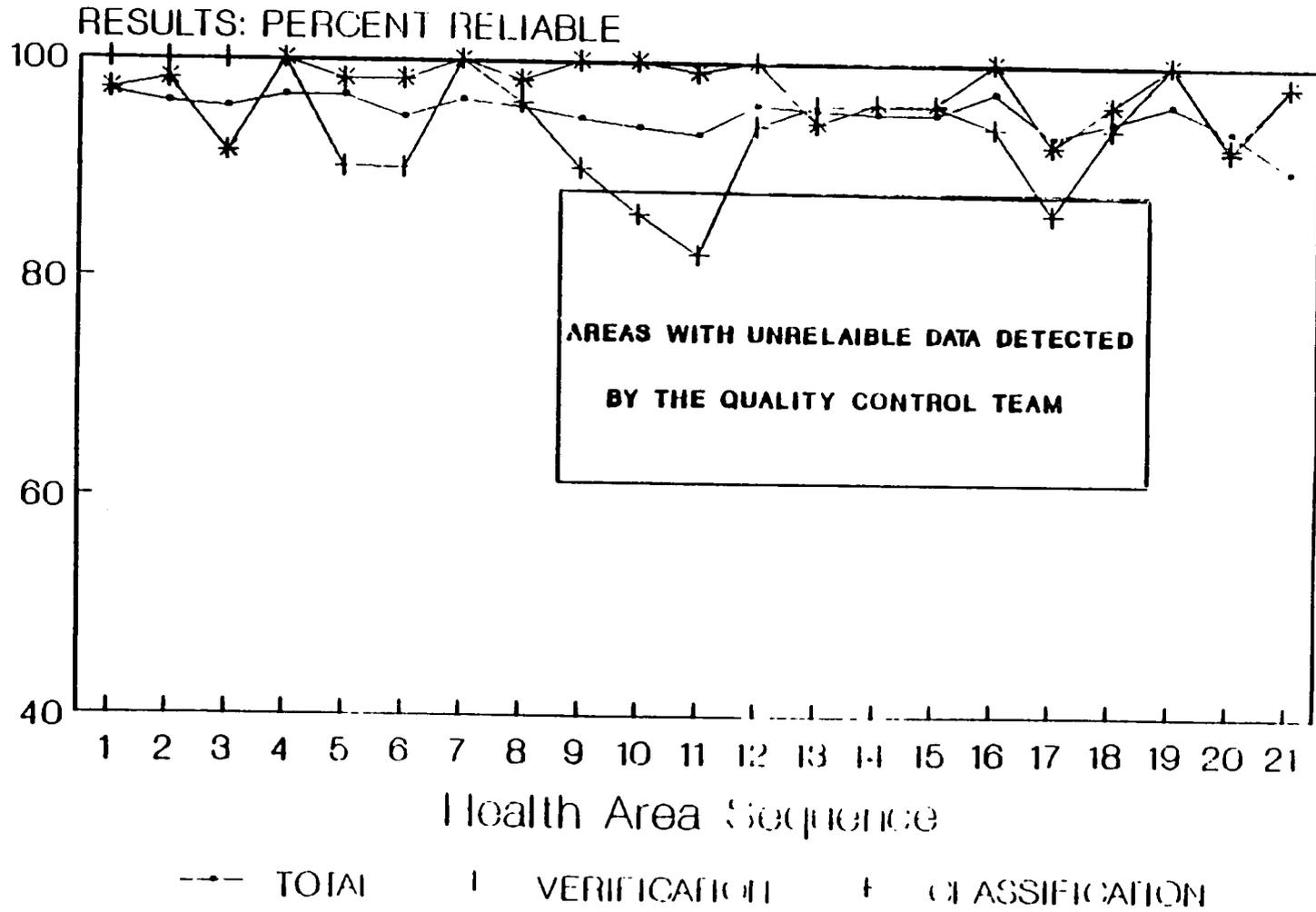


FIGURE 1B

Group 2

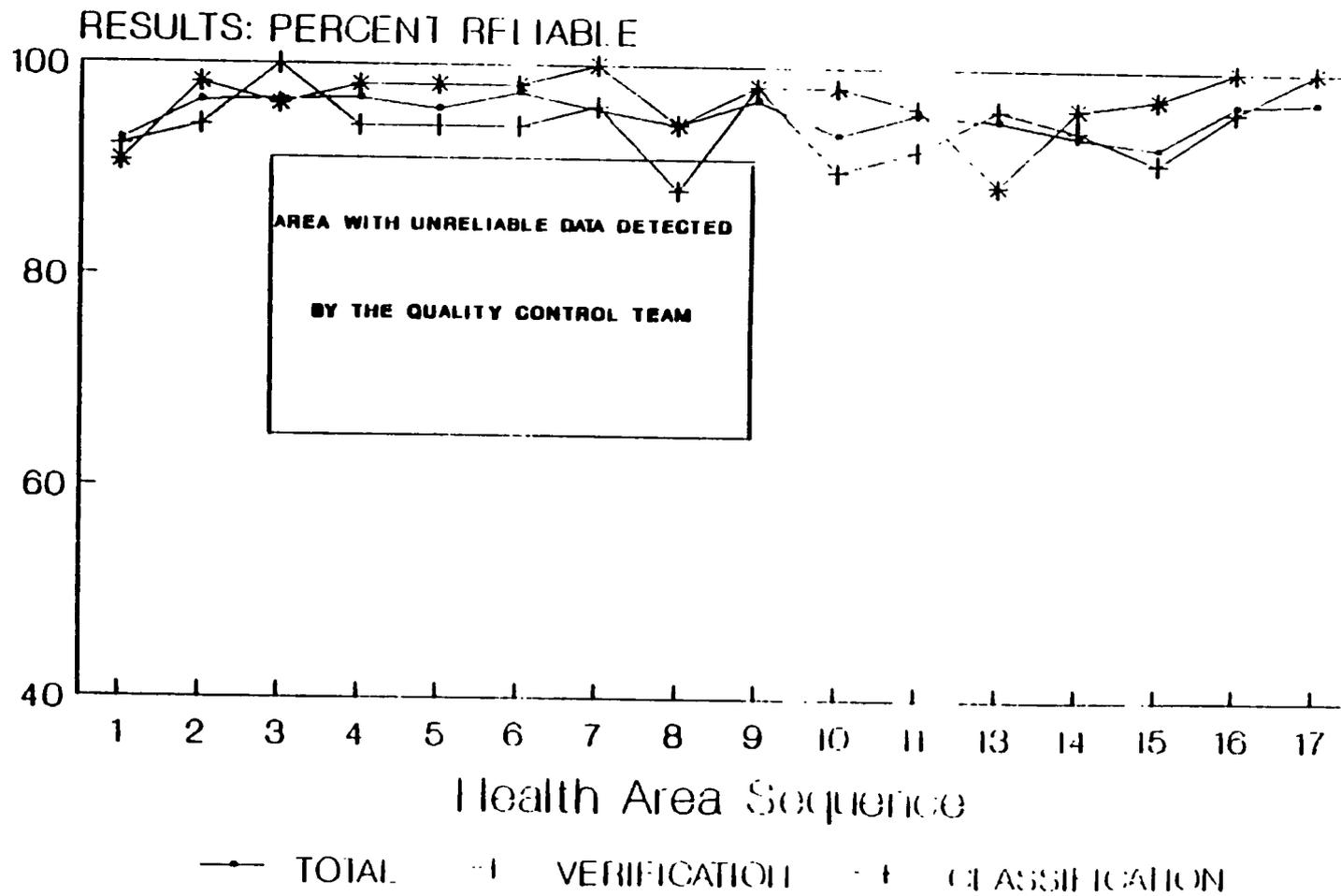
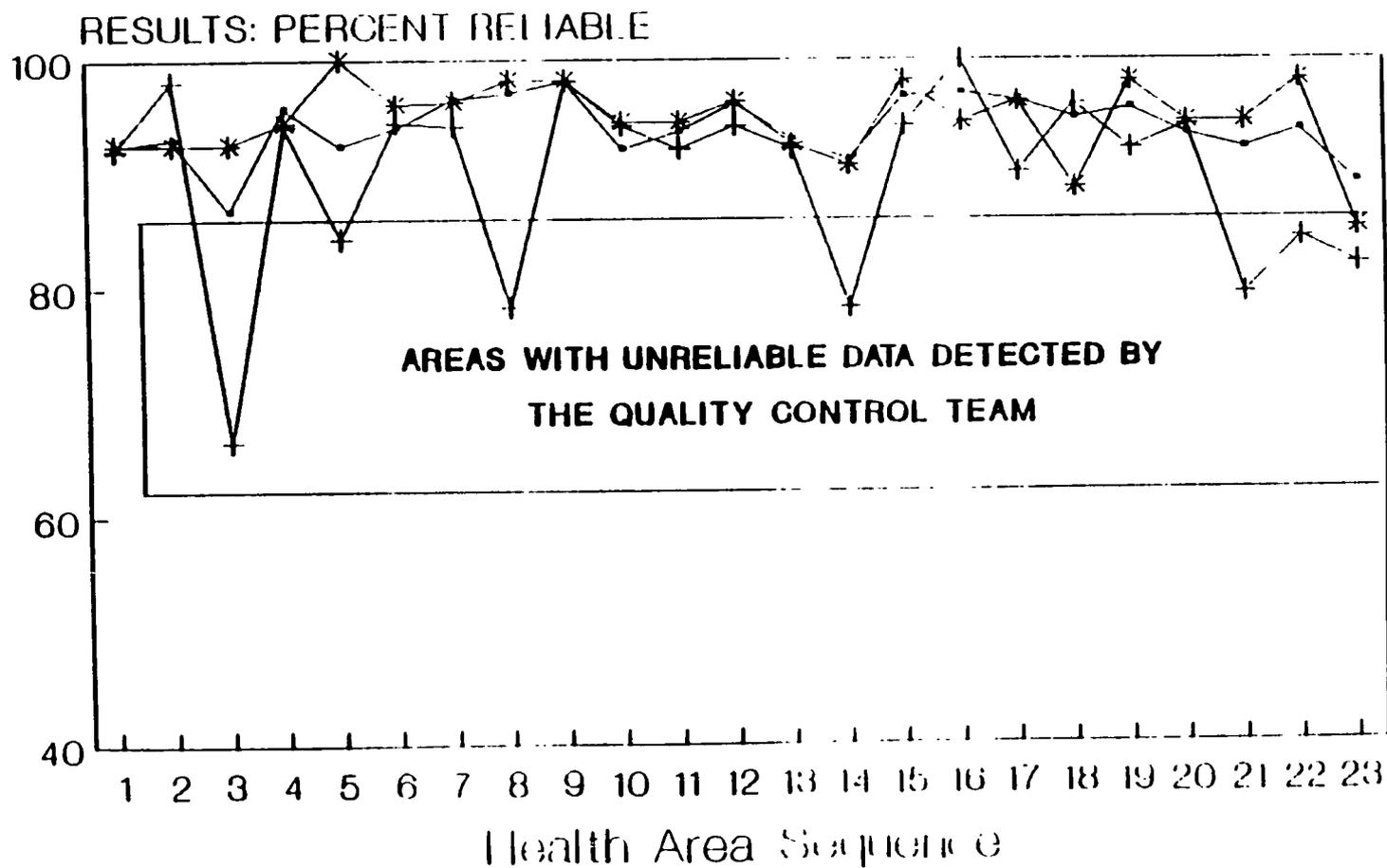


FIGURE 1C

Group 3



—•— TOTAL + VERIFICATION + CLASSIFICATION

25

portions of the questionnaire in which health records were contrasted with interview data (Figure 1abc).⁹

RESULTS

In response to the needs of the Ministry of Health, the project evaluated the following activities of the Primary Health Care Program:

- 1) Home Visits by CHWs
- 2) Vaccinations (Polio 1,2,3; DPT 1,2,3; Measles)
- 3) Referral of Pregnancies to a Doctor
- 4) Referral of New Borns to a Doctor
- 5) Oral Rehydration Therapy (knowledge, use, preparation)

Each of these five activities are discussed separately in the following sections.

HOME VISITS

Two criteria were used to evaluate this activity. The first

⁹ In addition to the already mentioned function of the quality control team, it had the additional responsibility of randomly selecting from the health archives of each HA 28 families with children under three years of age. The family health archives were used as the sources of information to fill out LQAS questionnaires, (the same questionnaires used for the HAs).

These data were collected in order to develop LQAS methodology and to study its economics when archives rather than household data are used for assessing coverage. This study will be presented to the authorities of the Ministry in the coming months. If the results of this comparison prove to be reliable when compared to the household study, this approach will be used in order to avoid the costs of the household study.

criterion was liberal. Any home in which the Household Register¹⁰ indicated no visit at all during the 4 months preceeding the interview were considered as homes not adequately covered by the health worker. The 4 month interval was chosen for the project since the Ministry requires a minimum of three visits annually to each household. Households which did not have a Household Register were not judged as deficient under this criterion. In other words, the CHW was given the benefit of the doubt. National coverage by this activity was 78% (CI:±2%). However, 13 of the 60 Areas evaluated were operating below the MOH standards (See Annex 3 for list of the number of defective households in the sample of 28 children of each HA).

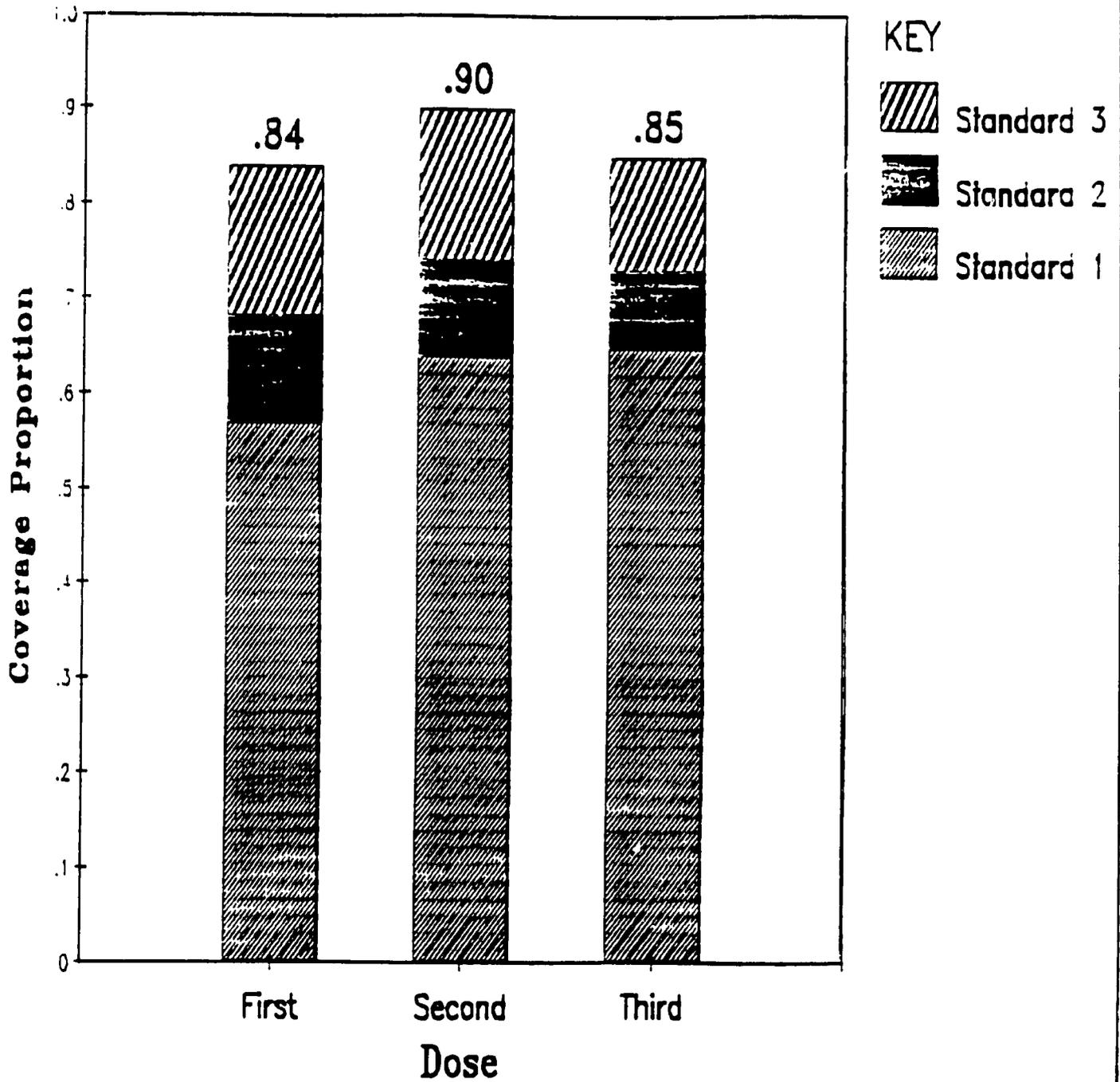
The second criterion was conservative. For this set of HA classifications, any household that either had not been visited during a 4 month interval or that did not have a Household Register was considered deficient. The results using this criterion were worse. National Coverage was 34% (CI:±5%). Only 7 Areas were classified as acceptable.

An important observation arises from having performed the analysis using two criteria. The difference in the results is primarily due to the fact that 44% of the houses interviewed had no Household Register. Only 22% of the homes visited had a Household Register that indicated a visit more than four months prior to the interview. Given these results, the following questions arose: Are 44% of the families not covered? If they are, why didn't they have a Household Register?

¹⁰ The Household Register is a Ministry of Health form found in the home in which the health worker writes the date of his last visit and signs his name.

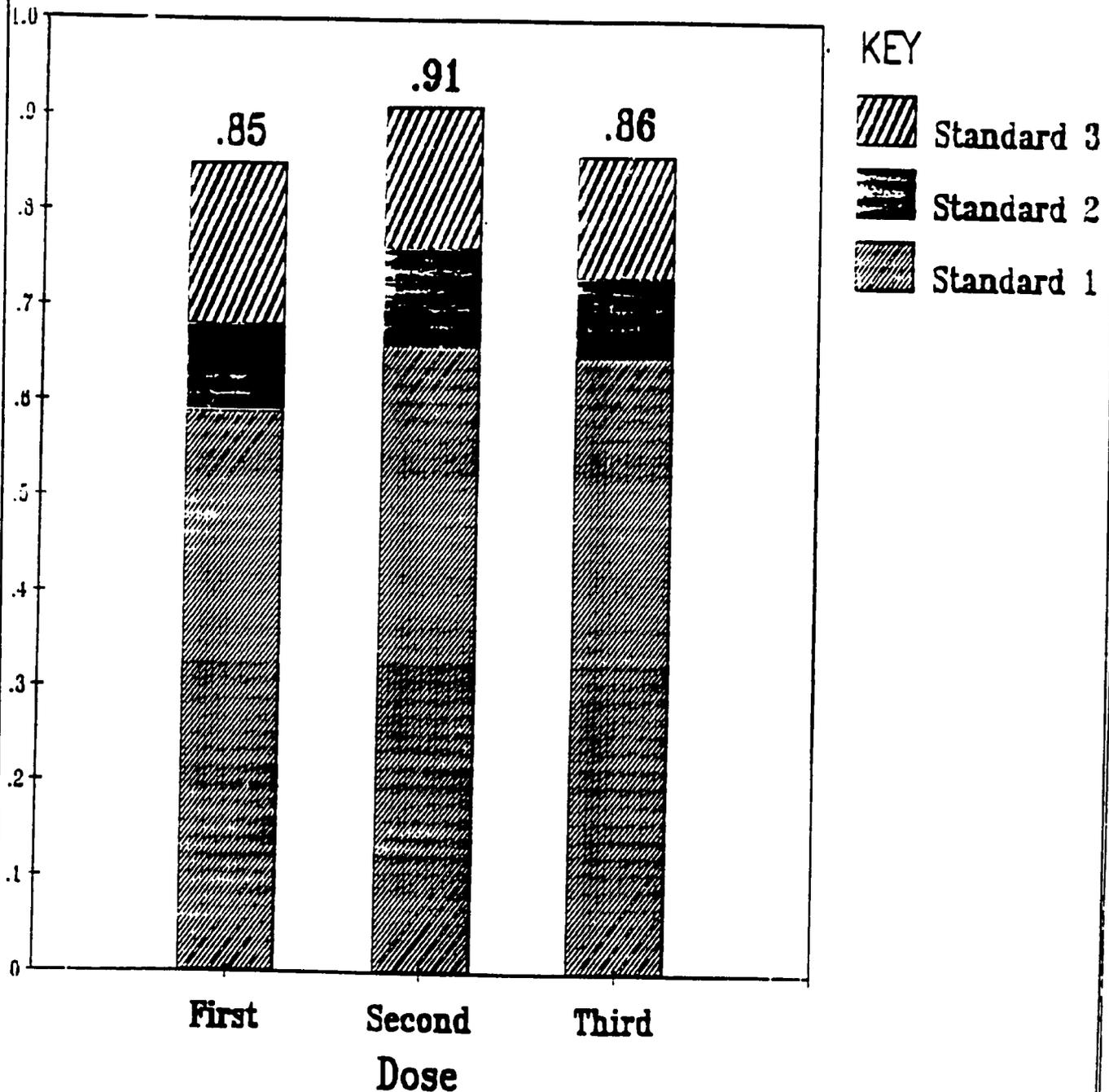
FIGURE 2

POLIO VACCINATION COVERAGE IN COSTA RICA USING 3 STANDARDS: LQAS Data Analysis



3 Standards: 1.5-2.5 Mo., 1.5-3 Mo., 1.5-5.5 Mo.

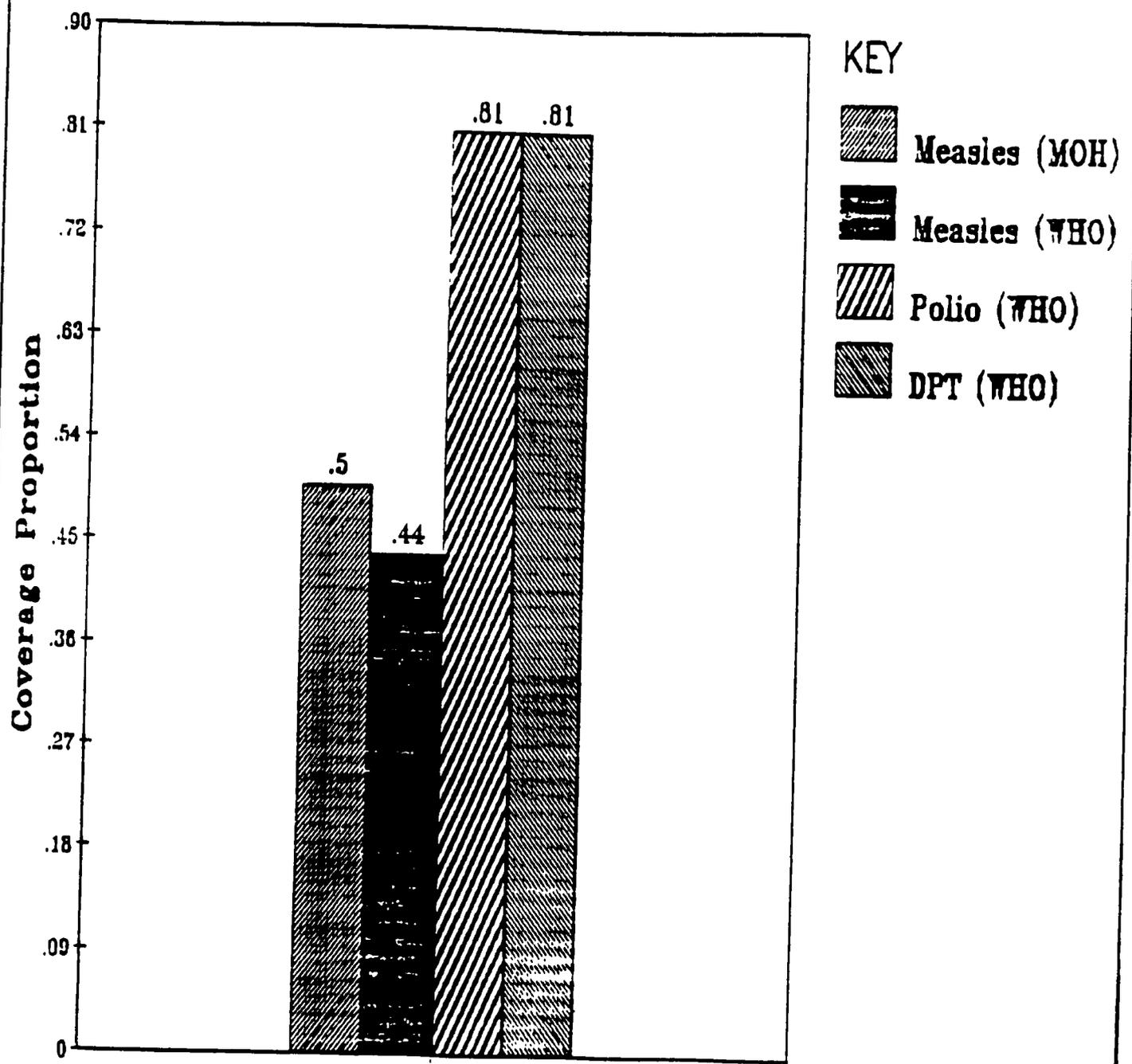
FIGURE 3
**DPT VACCINATION COVERAGE
 IN COSTA RICA
 USING 3 STANDARDS:
 LQAS Data Analysis**



3 Standards: 1.5-2.5 Mo., 1.5-3 Mo., 1.5-5.5 Mo.

FIGURE 4

MEASLES VACCINATION COVERAGE USING MINISTRY OF HEALTH CRITERIA AND ALL VACCINATION COVERAGE BY W.H.O. INTERNATIONAL STANDARDS



WHO Standards: Complete Vaccination by 11 Mo.
Measles: (MOH) 6-12 Months, (WHO) within First Year

These and other related questions will be examined in the diagnosis stage of the project, 1988-1989.

VACCINATIONS

Two types of assessments were performed: one was based on MOH standards and another based upon the international standards established by WHO.

I. Screening Health Facilities According to Ministry of Health Standards

According to MOH standards, all children should receive 3 doses of DPT vaccination, 3 doses of polio vaccination and one dose of measles vaccination within the 11 months of life according to the following schedule:

- 1) DPT: The first dose should be received at two months of age. The second and third doses should be received at two month intervals (see Figure 2).
- 2) Polio: The same standards hold for Polio as for DPT (see Figure 3).
- 3) Measles: One dose should be received between 6 and 11 months of age (see Figure 4).

Vaccination cards of all children were examined to determine

whether or not they had been vaccinated in accordance with the MCH standard. Boosters were not considered.

Regional and national coverages for each vaccination are listed in Table 1 with their corresponding confidence intervals. The number of defective children in each HA's sample of 28 appears in Annex 4. The performance of each HA for each vaccination is listed according to their Health Center and Region in Annex 5.

First Polio and DPT Doses

The formal MOH norms were modified for analytic purposes since one cannot expect a dose of, say, polio 1 to be administered exactly at two months of age. Three standards were applied to evaluate the first dose of DPT and Polio vaccination. All of the coverage proportions reported have been weighted by the number of children in a given HA.

Standard 1: Children vaccinated between the ages of 1.5 and 2.5 months inclusive, were considered acceptable. This rule extends the MOH standard by ± 15 days. National coverage with Polio 1 was 57% (CI: $\pm 2\%$), and 59% (CI: $\pm 2\%$) for DPT. Some 47 HAs were substandard in polio coverage and 44 HAs were substandard for DPT coverage.

Standard 2: The lower age limit remained at 15 months, as in Standard 1; the upper bounds was increased by an additional 2 weeks. Therefore, the acceptable age interval to have received the vaccinations was 1.5 to 3 months of age.

Accordingly, national coverage was 68% (CI:±2%) for both the first dose of polio and the first dose of DPT. Some 33 HAs were deficient in polio coverage and 27 HAs were deficient in DPT coverage.

Standard 3: This standard was established by assuming that a child should at the very least be vaccinated during the CHW's visit to the family. The minimum number of visits of a CHW to a household according to MOH standards is four visits annually (1 visit every 4 months). Therefore, if we assume that the last visit of the CHW was one day prior to the minimum age at which a child should receive the first vaccination, (i.e., 1.5 months of age), the child would be eligible for the vaccination during the next visit (i.e., at 5.5 months of age) four months later. Thus, the acceptable age interval at which a child can be vaccinated is 1.5 - 5.5 months.

Standard 3 raises a potential problem for the health system. Children who are first seen by the CHW when they are younger than 1.5 months of age need to wait until the next visit before being vaccinated. If these children wait for the CHW's following visits to receive their second and third polio and DPT doses at intervals of 5.5 months, they will not be able to complete the vaccination series before their birthday. Indeed they would be 16.5 months of age before receiving the third dose. Nevertheless, Standard 3 established a practical norm for evaluating vaccinations. National coverage by Polio 1 was 84% (CI:±2%); two HAs were defective. DPT coverage was 85%

(CI: $\pm 2\%$); one HA was defective. See Annex 3 for a summary of coverage statistics, and Annex 5 for a list of deficient HAs.

Second and Third Polio and DPT Doses:

The previous three standards were also used for evaluating the second and third doses of Polio and DPT vaccinations. For example, according to standard 1 (1.5 - 5.5 months) if a child received the first dose of DPT at the age of 2 months, the second dose would have to be received when the child is between 3.5 and 4.5 months in order for the coverage to be considered as acceptable. Using standard 2 (1.5 - 3 months), the vaccinations would be acceptable if the child is between 3.5 and 5 months. For standard 3 (1.5 - 4 months), the child should be between 3.5 months and 6 months. National coverage according to each standard was calculated as follows: (standard 1) 64% (CI: $\pm 2\%$), (standard 2) 75% (CI: $\pm 2\%$), and (standard 3) 91% (CI: $\pm 2\%$) for the second dose of DPT (See Annex 3).

According to standard 1, 33 HAs were deficient in polio 2 coverage; by standard 2, 12 deficient HAs were substandard; by standard 3 all HAs were acceptable. The same distribution of substandard HAs was found for the second dose of DPT with the exception of standard 1 in which 31 HAs were deficient.

The analysis of coverage for the third dose of both polio and DPT used the same three standards. The calculations of national polio 3 coverage using standards 1, 2 and 3, respectively, were 65% (CI: $\pm 2\%$), 73% (CI: $\pm 2\%$) and 85% (CI: $\pm 2\%$); DPT coverage proportions were 65% (CI: $\pm 2\%$), 73% (CI: $\pm 2\%$) and 91% (CI: $\pm 2\%$), respectively (See Annex 3).

The number of HAs determined deficient for the third polio and DPT doses were also similar. For polio 3 Standard 1, 33 HAs were deficient; by Standard 2, 17 HAs were substandard, and one HA was not acceptable by Standard 3.

See Annex 5 for a listing of HAs deficient in their coverage with the second and third doses of polio and DPT (see Figure 2-3 for a summary of the results).

Measles

According to MOH standards, only children vaccinated within the period between 6 and 11 months were considered acceptable.

By this standard, national coverage was 50% (CI:±3%). This low level of coverage was homogenous throughout the country. Regional coverage proportions are as follows: 54% (CI:±5%) for South Central, 52% (CI:±7%) for North Central, 46% (CI:±7%) for the Huetar North, 49% (CI:±5%) for Chorotega, 45% (CI:±8%) for the Huetar Atlantica, and 50% (CI:±6%) for Brunca.

A detailed summary of these statistics at the national and regional levels is given in Figure 4, Annexes 3 and 4. See Annex 6 for a list of Coverage proportions by Health Center. In this regard, the Health Centers of Liberia and Sarapiquí exhibited the greatest deficiency, 35% and 38%, respectively. Annex 5 lists the names of all deficient HAs.

II. Evaluation of Vaccination According to WHO Standards

WHO's vaccination standards recommend that a child should receive 3 doses of polio and DPT vaccination within the first 11 months of life,

with at least a one month interval between doses, and 1 dose of measles vaccination between 9 and 12 months of age. To evaluate coverage according to this standard, only children between the ages of 12 and 15 months were included (see Figure 4 for a summary of the results).

National coverage for the complete polio series was 81% (CI:±2%). Coverage for the DPT series was also 81% (CI:±2%). Coverage by measles vaccination was 44% (CI:±3%).

REFERRAL OF PREGNANCIES:

If a mother had visited a physician at least once during the 9 months of pregnancy, (according to WHO standards), coverage was considered to be acceptable. If a mother never visited a doctor during the entire pregnancy, coverage was judged to be deficient.

For this service coverage was high. Some 93% (IC:±1%) of all pregnancies had been referred to a doctor. In addition, not one of the 60 HAs analyzed were deficient in this service. The percentage of coverage at the regional and Health Center level can be found in Figure 5, Annexes 3 and 6.

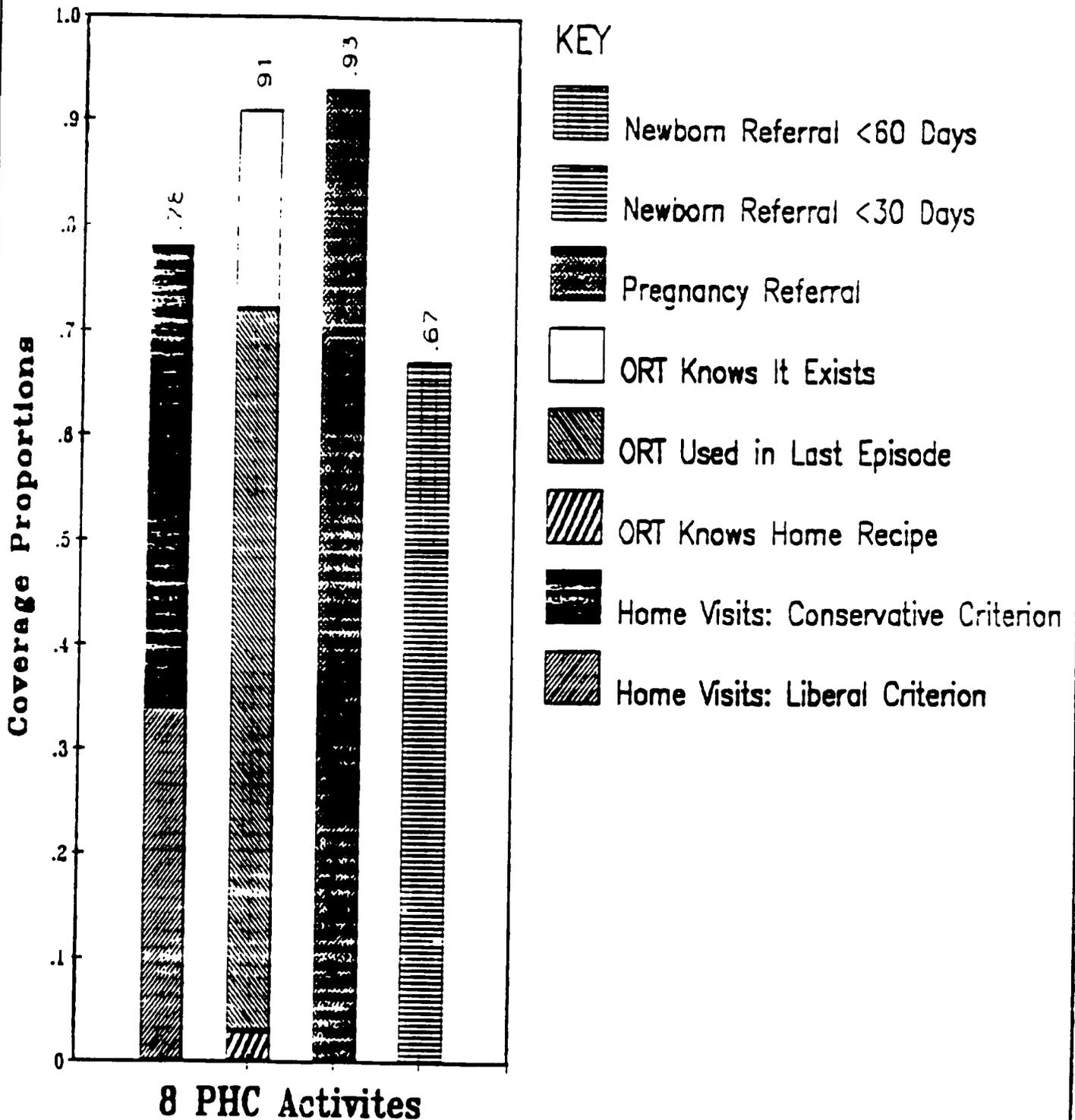
REFERRAL OF NEWBORNS:

Two standards were used to assess this activity. Standard 1: According to WHO standards all children should visit a physician within 30 days of birth. Children that had actually visited a physician within the first month of birth were considered as acceptable coverage.

Some 52 HAs were deficient. By standard 1, the national coverage was 49% (IC:±2%). Using standard 2, coverage increased to 67%

FIGURE 5

COVERAGE WITH 3 PHC ACTIVITIES: HOME VISITS, ORT, AND PREGNANT WOMEN AND NEWBORN REFERRAL IN COSTA RICA



(IC:±2%). Of the 60 HAs studied, 25 were deficient (See Figure 3, Annexes 3 and 5).

ORAL REHYDRATION THERAPY:

This service was evaluated using MOH standards. See Figure 5 for a summary of the results. According to the Primary Health Care Program, CHWs should:

- 1) Distribute packages of oral rehydration products in all of the households in their HA with children under 6 years of age.
- 2) Educate these families about the importance of oral rehydration therapy in the prevention of diarrhea.

The following indicators were used to evaluate this activity.

- 1) The proportion of mothers that were knowledgeable about the existence of oral rehydration salt envelopes.
- 2) The proportion of mothers that had used ORT envelopes during the child's last episode of diarrhea.
- 3) The proportion of mothers that knew how to prepare the household ORT mixture.

At the national level, 91% (IC:±1%) of the mothers knew that ORT envelopes existed. Some 72% (IC:±2%) of the mothers had actually used these packets during their child's last case of diarrhea. Only 3% (IC:±1%) knew how to prepare the household solution (See Annex 3).

None of the 60 HAs were defective with respect to the first indicator. All mothers knew ORT packets existed. Some 17 HAs were

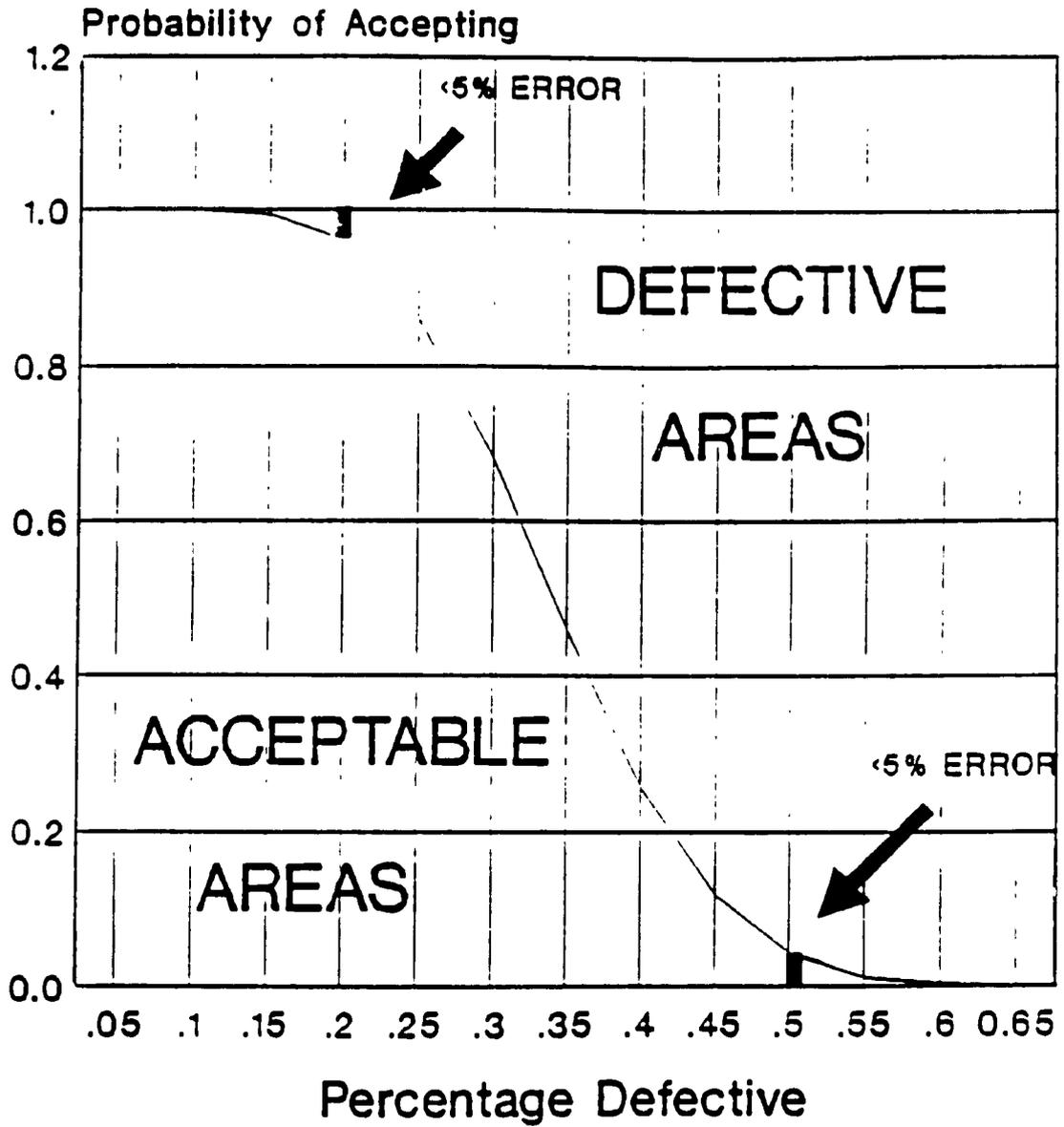
substandard in the use of oral rehydration therapy. All 60 were defective in regards to the mother's knowledge of how to prepare the household mixture. The names of defective HAs are listed in Annex 5. The results for regional and Health Center levels are given in Annexes 3 and 6, respectively.

ANNEXES

ANNEX 1

OPERATING CHARACTERISTIC CURVE

Sample = 28, 9 Defects Permitted



Both alpha and beta errors are 5%

N = 28

d	Cumulative Probabilities for Values of p with d Defects																		
	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95
0	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.002	.011	.052	.238
1	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.015	.063	.215	.588
2	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.004	.016	.055	.160	.377
3	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.004	.016	.055	.160	.377	.695
4	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.014	.047	.135	.315	.587	.858
5	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
6	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
7	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
8	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
9	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
10	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
14	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
15	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
16	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
17	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
18	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
19	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
20	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
21	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
22	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
23	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
24	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
25	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
26	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
27	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.003	.011	.039	.113	.264	.501	.765
28	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

ANNEX 2: PROBABILITIES FOR 28 SAMPLES

17)

ANNEX 3

TABLE 1: COVERAGE AT THE REGIONAL AND NATIONAL LEVEL

KEY:
 Ac. = Number of acceptable areas
 Def. = Number of defective Areas
 s1-s3 = See note below which defines standards 1-3
 NB = New Born
 Child. = Children

LEVEL OF COVERAGE FOR THE ENTIRE COUNTRY

Vaccinations	Rural		Urban		National		Total	Coverage Weighted	Confidence Interval
	Ac.	Def.	Ac.	Def.	Ac.	Def.			
Polio 1:s1	6	33	7	14	13	47	60	57%	2%
Polio 1:s2	15	24	12	9	27	33	60	68%	2%
Polio 1:s3	37	2	21	0	58	2	60	34%	1%
Polio 2:s1	14	25	13	8	27	33	60	64%	2%
Polio 2:s2	28	11	20	1	48	12	60	74%	2%
Polio 2:s3	39	0	21	0	60	0	60	90%	2%
Polio 3:s1	15	24	12	9	27	33	60	65%	2%
Polio 3:s2	23	16	20	1	43	17	60	73%	2%
Polio 3:s3	38	1	21	0	59	1	60	85%	2%
<hr/>									
DPT 1:s1	9	30	7	14	16	44	60	59%	2%
DPT 1:s2	20	19	13	8	33	27	60	68%	2%
DPT 1:s3	38	1	21	0	59	1	85	85%	2%
DPT 2:s1	18	21	11	10	29	31	60	66%	2%
DPT 2:s2	29	10	19	2	48	12	60	76%	2%
DPT 2:s3	39	0	21	0	60	0	60	91%	1%
DPT 3:s1	14	25	11	10	25	35	60	65%	2%
DPT 3:s2	27	12	19	2	46	14	60	73%	2%
DPT 3:s3	38	1	21	0	59	1	60	86%	2%
<hr/>									
Measles	2	37	0	21	2	58	60	50%	2%
<hr/>									
Polio:WHO	34	5	18	3	52	8	60	81%	2%
DPT:WHO	34	5	19	2	53	7	60	81%	2%
Measles:WHO	0	39	0	21	0	60	60	44%	3%

visits									
Standard 1	28	11	19	2	47	13	60	78%	2%
Standard 2	7	32	0	21	7	53	60	34%	5%
used	30	9	13	8	43	17	60	72%	2%
familiar	39	0	21	0	60	0	60	91%	1%
in Prepare	0	39	0	21	0	60	60	3%	1%
at Home									
escape									
referrals:									
pregnancies	39	0	21	0	60	0	60	93%	1%
child < 30 days	3	36	5	16	3	52	50	49%	2%
child < 60 days	18	21	17	4	25	25	60	67%	3%

■ Polio & DPT (based on the standards of the Ministry of Health):

Standard 1: DPT and Polio doses should be given within an interval of 1.5 & 2.5 months of each other

Standard 2: DPT and Polio doses should be given within and interval of 1.5 & 3 months of each other

Standard 3: DPT and Polio doses should be given within an interval of 1.5 & 5.5 months of each other

- Polio & DPT (based on the WHO Standard): Considers children who received the three Polio and DPT doses before completion of the first 11 months of life, with a one month interval between doses, as acceptable.

- Measles (Ministry's Standard): Considers children who received the three doses of Polio and DPT after 6 months and before 12 months of age as acceptable.

- Measles (WHO Standard): Considers children who received the doses after 9 months of age and before 12 months of age.

- Visits:

Standard 1: Each household in which the household register showed that there had not been at least one visit in the four months prior to the date of the interview was considered not covered.

Standard 2: We used the same standard as above but we also counted as defective all households which did not possess a household register at the time of the interview.

- Use of ORT: Proportion of mothers who had used ORT during their child's last case of diarrhea.

- Knowledge of ORT:

Proportion of mothers who knew of the existence of ORT.

- Knowledge of Preparation of ORT:

Proportion of mothers who knew how to prepare the home recipe of ORT.

ANNEX 4

LIST OF HEALTH FACILITIES BY TOTAL NUMBER OF SERVICES
FOUND TO BE DEFECTIVE: 1987

HEALTH CENTER	HEALTH FACILITY	HEALTH POST CODE	TOTAL NUMBER OF SERVICES FOUND TO BE DEFECTIVE
REGION ==> BRUNCA			
C.S. SAN ISIDRO DE PEREZ ZELEDON	P.S. RIVAS DE PEREZ ZELEDON	01	2
C.S. SAN VITO DE COTO BRUS	P.S. AGUA BUENA DE COTO BRUS	02	2
C.S. PALMAR NORTE	P.S. PALMAR NORTE DE OSA	03	3
C.S. CIUDAD CORTES	P.S. SIERPE DE OSA	05	3
C.S. CIUDAD CORTES	P.S. TINOCO DE OSA	06	3
C.S. SAN VITO DE COTO BRUS	P.S. SAN RAFAEL DE COTO BRUS	09	3
C.S. SAN ISIDRO DE PEREZ ZELEDON	P.S. LA UVITA DE OSA	05	-
C.S. SAN ISIDRO DE PEREZ ZELEDON	P.S. PLATANILLO DE PEREZ ZELEDON	07	-
C.S. SAN VITO DE COTO BRUS	P.S. LOS REYES DE COTO BRUS	06	-
C.S. GOLFITO	AREA AT.PRIMARIA URB. C.S. GOLFITO	01	-
REGION ==> CENTRAL NORTE			
C.S. VALVERDE VEGA	AREA AT.PRIMARIA URB. C.S. VALVERDE	01	2
C.S. HEREDIA	AREA AT.PRIMARIA URB. C.S. HEREDIA	01	2
C.S. HEREDIA	AREA AT.PRIMARIA URB. C.S. HEREDIA	03	2
C.S. BARVA	AREA AT.PRIMARIA URB. C.S. BARVA	01	2
C.S. ALAJUELA	P.S. TURRUCARES DE ALAJUELA	12	2
C.S. HEREDIA	AREA AT.PRIMARIA URB. C.S. HEREDIA	02	3
C.S. ALAJUELA	P.S. CARRIZAL DE ALAJUELA	04	3
C.S. ALAJUELA	P.S. SABANILLA DE ALAJUELA	09	-
REGION ==> CENTRAL SUR			
C.S. ACOSTA	P.S. GUAYABO DE MORA	02	1
C.S. SANTA ANA	AREA AT.PRIMARIA URB. C.S. SANTA ANA	01	2
C.S. CRISTO REY	AREA AT.PRIMARIA URB. C.S. CRISTO REY	03	2
C.S. PARAISO	AREA AT.PRIMARIA URB. C.S. PARAISO	01	2
C.S. TURRIALBA	AREA AT.PRIMARIA URB. C.S. TURRIALBA	02	2
C.S. TURRIALBA	AREA AT.PRIMARIA URB. C.S. TURRIALBA	03	2
C.S. CURRIDABAT	AREA AT.PRIMARIA URB. C.S. CURRIDABAT	01	2
C.S. ACOSTA	P.S. PALMICHAL DE ACOSTA	06	3
C.S. ACOSTA	P.S. VUELTA DE JORCO	09	3
C.S. ASERRI	AREA AT.PRIMARIA URB. C.S. ASERRI	01	3
C.S. CRISTO REY	AREA AT.PRIMARIA URB. C.S. CRISTO REY	02	3
C.S. PARAISO	P.S. PACAYAS DE ALVARADO	10	3

HEALTH CENTER	HEALTH FACILITY	HEALTH POST CODE	TOTAL NUMBER OF SERVICES FOUND TO BE DEFECTIVE
C.S. CRISTO REY	AREA AT.PRIMARIA URB. C.S. CRISTO REY	01	-
C.S. PARAISO	P.S. CORRALILLO	03	6
C.S. PARAISO	P.S. CACHI DE PARAISO	06	2
C.S. TURRIALBA	AREA AT.PRIMARIA URB. C.S. TURRIALBA	01	2

REGION ==> CHOROTEGA

C.S. SANTA CRUZ	AREA AT.PRIMARIA URB. C.S. SANTA CRUZ	01	2
C.S. PUNTARENAS	AREA AT.PRIMARIA URB. C.S. PUNTARENAS	01	3
C.S. PUNTARENAS	AREA AT.PRIMARIA URB. C.S. PUNTARENAS	02	3
C.S. PUNTARENAS	AREA AT.PRIMARIA URB. C.S. PUNTARENAS	03	3
C.S. LIBERIA	P.S. BELEN DE CARRILLO	02	3
C.S. LIBERIA	P.S. FORTUNA DE BAGACES	05	3
C.S. LIBERIA	P.S. SAN ISIDRO DE AGUAS CLARAS	09	3
C.S. NICOYA	P.S. MANSION DE NICOYA	04	3
C.S. NICOYA	P.S. QUEBRADA MONDA DE NICOYA	07	3
C.S. LAS JUNTAS DE ABANGARES	P.S. COLORADO DE ABANGARES	01	3
C.S. LAS JUNTAS DE ABANGARES	P.S. LAS JUNTAS DE ABANGARES	04	3
C.S. LAS JUNTAS DE ABANGARES	P.S. SAN BUENAVENTURA DE ABANGARES	07	3
C.S. ESPARZA	AREA AT.PRIMARIA URB. C.S. ESPARZA	01	4
C.S. NICOYA	P.S. BOCAS DE NOSSARA	01	6

REGION ==> HUETAR ATLANTIC

C.S. GUAPILES	P.S. COLONIA SAN RAFAEL DE POCOCI	03	2
C.S. GUAPILES	P.S. LOS ANGELES DE POCOCI	06	3
C.S. LIMON	P.S. LA BOMBA DE LIMON	06	3
C.S. GUAPILES	P.S. PALMITAS DE POCOCI	01	-
C.S. LIMON	P.S. PENHURST DE LIMON	02	-
C.S. LIMON	P.S. BARRA DEL PARISHINA	04	-

REGION ==> HUETAR NORTE

C.S. SARAPIQUI	P.S. UNION DE RIO FRIO	06	2
C.S. SARAPIQUI	P.S. BUENOS AIRES DE SARAPIQUI	02	3
C.S. SARAPIQUI	P.S. SAN MIGUEL DE SARAPIQUI	08	3
C.S. SAN CARLOS	P.S. COPEVEGA	01	3
C.S. SAN CARLOS	P.S. SANTA ROSA DE SAN CARLOS	03	3
C.S. SAN CARLOS	P.S. SAN JOAQUIN DE SAN CARLOS	06	3

74

ANNEX 9

INSTRUMENTS USED

- Maps and hand drawn maps from the Department of Statistics, the Census and hand drawn maps from the Ministry of Health.
- Questionnaires for households with children, created by the project team.
- Instruction manual for the filling out of the questionnaires created by the project team.
- Formulas for the calculation of the Quality Control of the interviews created by Dr. Joseph J. Valadez
- Random Number Tables
- LQAS Tables created by Dr. Josepn J. Valadez
- Kilometric mileage diaries of the vehicles used by the interviewers

INFORMATION SOURCES MOST USED

- Family Charts
- Individual Control Cards
- Forms: Moniteration of Pregnancies and New Borns
- Weight/Age and Height/Age Curves
- Vaccination Notebooks
- Summary of basic health statistics for each Area
- Household Registers
- Lists of Health Posts and Community Health Areas
- Lists of the CHW's according to work Areas

ANNEX 10

Calculating Coverage Proportions and
Confidence Intervals with LQAS Data

This section demonstrates the procedures for calculating coverage proportions using LQAS data. Because the number of children varies from one HP to another, the formula requires that the results from any one HA be weighted by the number of children in the target population of that particular HA. In this example 5 HAs are assumed rather than the 60 that were included in this work. Also the sample size is smaller than the 28 used, and the number of children in the target population are fewer than were found in the 60 selected HAs.

Table 2.2: A Example of Calculating Weighted Coverage Proportions

HA	n	d	(n-d)/n	N	wt.	wt. ((n-d)/n)
1	12	2	.83	23	23/105	.18
2	12	3	.75	15	15/105	.11
3	12	0	1.00	29	29/105	.28
4	12	6	.50	17	17/105	.08
5	12	5	.58	21	21/105	.12
	60	16		105		.77

Key: HA = Health Area Code
n = LQAS Sample Size
d = Number of Unvaccinated Children Permitted in the Sample
N = Number of Individuals in the Target Population

An estimate of coverage in the area of these 5 HAs is therefore, 77%.
The 95% confidence interval for this result would be calculated as
follows:

$$\pm 1.96 \times \sqrt{\sum ([wt.]_i (p_i q_i)) / n_i}.$$

ANNEX 11

A Hypothetical Application of LQAS

As already mentioned, LQAS sampling uses the binomial formula.

$$P_a = (n! / [a! (n-a)!]) p^a q^{(n-a)}$$

The above formula was used for calculating all of the probabilities in Table 2.1. In each case the expected value (i.e., 30% or 50%) is the value of "p". Three rows are marked with an asterisk to denote LQAS sample size options that may be propitious. Each has its own advantages and disadvantages. The first option consists of a sample size of 12; 3 or fewer uncovered people are permitted. With such a design the evaluator would identify 79.5% of the HAs that have achieved 30% coverage of their communities.

Similarly, this design (i.e., $n = 12$, $d = 3$) would misclassify 7% of those HAs that actually had substandard coverage as acceptable. Therefore, 93% of the substandard HAs would be accurately identified.

These calculations were performed as follows:

The probability of correctly identifying an HA in which zero unimmunized individuals were permitted in a sample of 12 individuals assuming the true level of coverage was 80% of the population is:

$$P_a = p^n = .80^{12} = .0687$$

The probability of properly identifying an HA in which 1 unimmunized person was permitted in the sample is:

$$\begin{aligned} P_a &= (n! / [a! (n-a)!]) p^a q^{(n-a)} \\ &= (12) .80^{11} \times .20^1 = .2062 \end{aligned}$$

The probability of properly identifying an HA in which 2 unimmunized persons were permitted in the sample is:

$$P_2 = (66) p^{10} q^{12-10} = (66) .30^{10} \times .20^2 = .2835$$

And, the probability of properly identifying an HA in which 3 unimmunized persons were permitted in the sample is:

$$P_3 = (220) p^9 q^{12-9} = (220) .30^9 \times .20^3 = .2362$$

Therefore, the probability of properly identifying an HA in which 3 or fewer unimmunized person were permitted in the sample is:

$$(.0687 + .2062 + .2835 + .2362) = .7946 = 80\%$$

Similarly, the probability of properly identifying an HA in which 2 or fewer unimmunized persons were permitted in the sample is:

$$(.0687 + .2062 + .2835) = .5584 = 56\%$$

These results, .80 and .56 are found in Table 2.1 at the first asterisk.

The same formula was applied to calculate the probability of correctly identifying an HA whose true coverage was 50% by permitting 3 or fewer unimmunized individuals in the sample. This calculation is:

$$(.0002 + .0029 + .0161 + .0537) = .0729 = 7\%$$

Hence, there is a .93% (or $1.00 - .07$) probability that an HA in which coverage was 50% could be classified as a substandard HA.

Thus, with the design of $n = 12$, $d = 3$, and in which the expected coverage is 80%, some 79.5% of all the acceptable HAs would be correctly identified as would some 93% of those HAs whose coverage was 50% or lower. There remains the grey area of those HA whose coverage

s between 80% and 50%. Other OC curves could be calculated to determine the probabilities of their classification.

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II.

IEP - Vitamin A Project

IEF

MALAWI VITAMIN A PROJECT

The mid-term evaluation of IEF's Vitamin A Project (Cooperative Agreement OTR-0500-A-00-9159-00) was carried out between 15 and 20 October 1990. A team of seven persons spent several days (15-16 October) visiting villages in which the Vitamin A project was active. Included on that team were representatives of IEF (project director, project coordinator from headquarters, local project coordinator), two officials from the Ministry of Health (nutritionist from Lilongwe, Regional Primary Health Care Coordinator), ADRA's country director and the outside consultant. In addition, other persons participated in the project evaluation and discussions: the Regional Health Officer from the MOH, the UNICEF Social Mobilization Officer for EPI and AIDS, and the Director of USAID/Lilongwe's Health, Population and Nutrition Office.

The evaluation of the IEF project was guided by the Scope of Work as prepared by the IEF and forwarded to HKI which organized the joint evaluation of the ADRA and IEF vitamin A-related projects in Malawi under VITAP (Appendix I). The evaluation team also reviewed the Mid-term Evaluation Guidelines issued by the PVC Office (dated 5 July 1990) - see Appendix II. Prior to coming to Malawi, the outside consultant contacted the concerned officer in PVC to identify particular concerns that should be included in the evaluation. All relevant reports, documents, records and communications were reviewed; a list is provided in Appendix III. The visit to the project site in the Lower Shire Valley consisted of meetings with village leaders, Village Health Committees, Village Health Promoters and a selection of mothers in three villages. The evaluation team also had the opportunity to discuss the project with the District Health Inspector, Ophthalmological Medical Assistants (OMA), and Health Surveillance Assistants (HSA) who are involved in the support and implementation of the Vitamin A Project. Appendix IV gives the names of those participating in the evaluation and as well as those with whom the evaluation team met. Prior to departure from Malawi, debriefings, including presentation of findings and recommendations, were conducted with the IEF project staff (including a representative from IEF headquarters in Bethesda) as well as USAID/Lilongwe.

A. Background

1. Project Development

In December 1988, IEF submitted a proposal for a very large, five-year Child Survival and Blindness Prevention Program for the Lower Shire Valley which was to cover the entire population of the valley, estimated at that time to be 366,000 people. The project was to deliver a comprehensive package of community-based child survival interventions, including ORT, immunization, nutrition/vitamin A, birth spacing, curative care and water/sanitation. The original project had dual objectives: to reduce infant and child morbidity and mortality and to reduce the prevalence of vitamin A deficiency. IEF requested over \$2.6 million as the A.I.D. contribution (out of a total project cost of almost \$3.8 million).

The comprehensive program was not selected for Child Survival funding, but A.I.D. suggested that IEF modify the proposal and resubmit it as a vitamin A project. IEF was informed that \$530,000 was available for programming. In the short time given for this resubmission, IEF prepared a one-page project description. According to this document (Appendix V), the project was to focus on expanding and strengthening their existing vitamin A project in the Lower Shire Valley. A nutrition education package and an information system to track vitamin A activities were also to be included. The entire population of the valley was still to be served. With the IEF contribution, the total budget came to slightly less than \$850,000. IEF remains unclear as to the source of the funding. From the grant agreement it appears that funds were taken from two sources, both originating in the FVA/PVC office. The project has been supervised by the PVC Office.

Not having had time to redesign the project in any detail, IEF spelled out what the Vitamin A Project would consist of in the Detailed Implementation Plan (DIP), submitted in late 1989. It is this document that is currently guiding the implementation of the project.

2. Project Setting

The Lower Shire Valley where the Vitamin A Project is being implemented is the southwestern tip of Malawi. The valley is made up of two districts, Chikwawa toward the north and Nsanje to the south. These lowlands are semi-arid during most of the year, while suffering extensive flooding during the rainy season.

The Valley is plagued by high rates of child malnutrition and has one of the highest infant mortality rates in the country, estimated in the late 1970s as being 205 out of every 1,000 infants born. A survey carried out 1983 found that 22.3% of the under five population suffered from moderate to severe stunting (<90% height for age); 2.8% showed signs of severe wasting (<80% weight for height). Ocular signs of vitamin A deficiency in the Lower Shire Valley were reported to be 4% among the under 6 population; 30% of the same age group had clinical signs of inflammatory trachoma. As pointed out in IEF's original proposal, the rates for active or corneal ulceration vitamin A deficiency in the Valley are 5 to 10 times higher than the WHO criteria for identifying a problem of public health significance. The malnutrition-related problems are exacerbated by a serious water shortage which results in high rates of diarrheal diseases. Malaria is also endemic during parts of the year.

Adding to the Lower Shire Valley's already miserable situation is the influx of refugees from war-torn Mozambique which lays just across the Shire River. Nsanje District is currently host to almost a quarter of a million refugees, nearly 30% of the total in Malawi. A large number of the refugees are said to have moved into the villages of the Lower Shire Valley, increasing pressure on already scarce land resources and adding to the existing heavy health burden.

5/2

The recurrent costs of staff, transport and commodities are minimal. Some things could be done to facilitate a smooth transition. For one, instead of having IEF procure the vitamin A capsules, arrangements should be made to receive them through the government. If they are not available, the reason should be determined. If the project is to continued once IEF is no longer associated with it, a regular supply of vitamin A within Malawi must be identified. This should not present a problem since vitamin A has been classified as an essential drug and should be available at the Medical Stores through the District Health Officer.

Incentives for the VHPs is another concern. At present, the project provides them with very little in the form of incentives: a uniform, soap, a badge, a pair of shoes. But even that would be too much to expect the government to provide if it were to assume control. The possibility of the community providing such incentives in the future should be investigated. It is suggested that IEF conduct a study on what motivates VHPs. During year two of the Vitamin A Project, the PCVs should hold focus group sessions with selected VHPs to determine what non-monetary incentives would stimulate them and the number of drop-outs in the future. If the IEF approach is to be expanded and adopted more broadly, it is essential for the project to know what motivates volunteers within the Malawian context.

The DIP says that the project's activities of vitamin A distribution and nutrition do not offer any scope for cost recovery. While this is true, if activities were added like ORT and simple medicine distribution, possibly some cost recovery could be introduced.

The issue of sustainability will not be answered by the Vitamin A Project. A more serious effort focused on process issues is required. This is discussed a the final section of the report, in terms of what might come next.

7. Finance and Budget

The DIP review raised a question about the project's high cost per beneficiary. It should be noted that IEF responded in a very short time to the request for a revised proposal. They did not have sufficient time to think through how they would change the project from a more broad based Child Survival effort to a more focused vitamin A project. The details were not worked out until they went through the DIP development.

The evaluation team agrees that a total budget of over \$700,000 (combined A.I.D. and IEF) for a two-year project focusing most of its energies on vitamin A supplementation to a population of only 42,000 is too high. Now that the project has been launched and seems to be operating effectively, it is time to consider how the project might be expanded and/or broadened. The project director is interested in considering the best way to do this. Several possibilities exist. One is to expand in areas adjacent to villages already being covered. This would resolve the problem of jealousy referred to above. Another possibility is to add a fourth cluster of another 15 to 20 villages and 25-30 VHPs.

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The project hopes to upgrade the HSAs, the most peripheral health care worker in the Ministry's infrastructure. They staff health centers or posts while periodically visiting the villages in their areas. HSAs are terribly over extended, being responsible for as many as 30 to 40 villages each. The size of their service areas has seriously compromised their effectiveness. The Vitamin A Project will strengthen the HSA's link to the community by providing them with additional training and by adding VHPs who reside and work in the villages.

The villages chosen to participate in the Vitamin A Project had Village Health Committees which were strong enough to assure the potential for community involvement in project activities. The OMAs selected the most capable of their HSAs, those able to assume additional supervisory responsibilities. The villages select a woman to serve as the VHP; the criteria included literacy, and willingness and ability to promote child health/nutrition activities in their community.

According to the plan, one VHP was to cover approximately 50 families having a pregnant woman and/or children under six. Larger villages would have multiple VHPs. The VHPs would be responsible for carrying out the two mechanisms of delivery for project interventions, the village rallies and follow-up home visits. It was expected that the vast majority of the target population would receive their vitamin A supplements at the semi-annual rallies. In addition, quarterly rallies would serve as venues for eye examinations (by the OMAs) and nutrition education/demonstrations for village women. Home visits were to be made to those homes of newly delivered mothers and those children between 6 and 72 months who did not attend the rally. The VHP's roster or population-based register was to enable the village volunteer to manage her operations. The HSAs and OMAs were to supervise and support the VHPs in their community work.

Two Peace Corps Volunteers (PCVs) were to divide the project area and concentrate their energies on the nutrition component, primarily increasing the consumption of energy-dense and vitamin A-rich foods by the vulnerable target group. With their anthropological backgrounds, the PCVs were to conduct qualitative research into local eating and feeding habits.

C. Findings

In terms of the vitamin A distribution objective, IEF's Vitamin A Project has been very successful, reaching and even surpassing its targets within the first year. The project has developed an effective infrastructure through the training of the OMAs, HSAs and, most importantly, the VHPs. The project has been less successful in the nutrition/improved child feeding aspect of the project. The progress to date indicates that more can be done to utilize the community-based capacity that has been developed. This could consist of expanding the services provided and/or expanding the number of villages covered. The basis for a larger, more fully integrated Child Survival effort has been established.

There are a number of aspects of the Vitamin A Project which are of interest and will be reviewed in this section of the report. These consist of manpower development, project coverage, information systems, collaboration, community involvement, sustainability, finance and budget, and, finally, the A.I.D. process.

1. Manpower Development

The Vitamin A Project has trained the target number of HSAs (9) and VHPs (78) that had been planned. The HSA training took place between 23 and 26 October 1989. The course was developed in accordance with the task description for the HSAs (Appendix VII). A set of training materials were prepared for both the HSA and VHP trainings (Appendix VIII).

The training of the 78 VHPs has taken place in four different groups: 30 October-2 November 1989 (19 participants), 13-16 November 1989 (18 participants), 27-30 November 1989 (14 participants) and April 1990 (27 participants). The tasks of the VHPs (Appendix IX) served as the basis for the VHP training objectives (Appendix X). A sample of a VHP training course is provided in Appendix XI. It is important that all the VHPs are women; they are the only ones capable of carrying out the VHPs' job description.

While the quantitative target for training have been achieved, it is very difficult to determine retrospectively the quality of the HSA and VHP training. However, from what the evaluation team was able to determine during its site visits, the project field staff seem to have been adequately prepared for their respective tasks. The quantitative data from the project supports this assessment at least in terms of vitamin A coverage (see section IV.2 below). More problems arise in the nutrition education aspect which is certainly much more difficult given the serious economic and environmental conditions in the Lower Shire Valley.

2. Intervention Coverage

The coverage target of 80% of the children under six and postpartum mothers receiving vitamin A capsules apparently have been exceeded. In the baseline survey, IEF found that less than 16% of the under six children had received vitamin A during the last six months; slightly more than 32% of the recently delivered mothers had received a vitamin A supplement within two months of delivery. The most recent figures from the project indicate that in seven out of the nine project areas¹ 94% of the under sixes and 88% of the new mothers were covered during the latest rallies. There is no doubt that the IEF has succeeded in their vitamin A delivery objectives.

The combination of the rallies with follow-up home visits of those not attending or requiring special attention is unbeatable. Each VHP covers an average of 56 households, ranging from 53 to 90. The evaluation team was

¹ The figures from two of the HSA's contain some inaccuracies and cannot be relied upon, therefore are not included.

5/6

impressed that the VHPs interviewed had intimate knowledge of the situation in all the households in their respective areas of responsibilities (e.g, knew number of current pregnancies and number and causes of under six deaths in the last year). As will be discussed, this capability might be able to be utilized more broadly.

The Vitamin A Project also has done a good job in the eye examination component. A total of 5,287 persons (42.5% under six) were examined in May and June 1990; another 4,160 persons (52.3% under six) were examined between August and October 1990. The largest percentage of the eye problems identified in the under six age group was conjunctivitis (28.9% in the earlier period, 46.7% in the latter). Active trachoma was also common (10.1% in the earlier and 9% in the latter). In the baseline survey, the figure was 12.7%. Xerophthalmia went from 0.62% in the May-June period to 0.18% in the August-October period. It is encouraging to see the sharp drop in the rate of xerophthalmia, but the sample is self-selected, is too small, and it is entirely too early to draw any connection between the IEF intervention and the reduction. Unfortunately, xerophthalmia figures were not collected as part of the baseline survey because the sample (approximately 10% of households) was too small to provide meaningful data.

The Vitamin A Project has included immunizations at the rallies from the start. The HSAs gave a total of almost 2,500 immunizations (evenly split between under and over ones) during the first series of rallies; another 1,153 were provided during the second round. The project only recorded the numbers by antigen; no information was collected as to number of DPT III, for example, which would indicate the completeness of coverage. Nothing was done on tetanus toxoid for women of child bearing age (WCBA) Nor was there any effort to utilize the project's population-based roster system in support of immunization coverage.

The biggest problem is undoubtedly in the nutrition education component of the project. To begin with, the target stated in the DIP is unrealistic; the team is not aware of any project that has been able to achieve 90% success in terms of appropriate feeding habits. The target is all the more inappropriate considering the two-year life of the project. Finally, the baseline findings (e.g., 6.4% of the 6-11 month olds consume energy-dense four times a day) indicate what an impossible target the project had set for itself. The DIP mentions the cultural barriers to increasing consumption of energy-dense and vitamin A-rich foods as well as the frequency of feedings among the infant and weanling population. While cultural constraints undoubtedly exist in the project area, the more serious concern appears to be food availability and the desperate poverty.

The efforts to improve infant and child feeding practices are made during the village rally sessions (in the form of demonstrations). The messages are reiterated and reinforced by the VHP during her monthly home visits. An effort is made to select the most appropriate message based on the age of the child in the particular household. The key nutritional messages delivered by the project can be found in the VHP training tasks (Appendix X).

57

Scanning the list of topics, one is impressed by its thoroughness. However, experience in successful nutrition education interventions elsewhere tells us that it is not the number of messages that is important. Rather, programs which have made an impact have been able to identify the most serious nutritional behavior problem, develop a limited number of appropriate messages and hammer away with them from several different angles. In the case of the Lower Shire Valley, some of the most pressing nutritional issues which a project might be able to influence include:

- exclusive breastfeeding for three months (baseline data indicates almost half of the mothers give their infants supplementary food before they reach two months);
- continuation of breastfeeding when the mother becomes pregnant (said to be a common problem and with such high birth rates and birth intervals of 2 years or less, this is a serious concern although no data on the problem was collected in the baseline survey);
- a specific weaning food (consisting of protein and energy sources that are readily available and affordable in the area).

Once a topic has been selected, the most effective messages are developed to bring about the desired behavioral change. The messages are presented in a number of different forms - e.g., demonstrations, interpersonally, by local dance, traditional bands, role play, folk theater. As success is achieved in one topic, the second highest priority topic is adopted and the same process is repeated. Some technical assistance in the social marketing approach might be helpful in support of the nutrition education component of the project.

One suggestion that was made to improve the education component of the project is to hire a field education support person to monitor and support the community-level education activities. The person, preferably a female with extensive applied nutrition education experience, would be responsible for working with those VHPs experiencing the greatest difficulties. She could instruct them on education methods and techniques (e.g., role play, folk dance and plays), do in-service training, monitor education sessions and organize local folk plays and music performances in support of the nutrition education component.

3. Information Systems

The IEF has devoted considerable attention to the development and implementation of an effective management information system. Technical assistance provided by the VITAL Project was helpful in this respect. The project has a firm grasp of the need for an effective information system:

- helps structure supervision (identifies where special attention is required);
- provides performance indicators for the field and community workers themselves; and

- gives the community immediate feedback on project impact (thereby increasing understanding and support).

The system that has been developed in the Vitamin A Project can be described as a Monitoring/Built-in Evaluation System. It provides project managers, field staff and community members with timely data on project performance. The indicators being tracked relate directly to the project objectives. For example, it is not difficult at any point in time to know the vitamin A distribution coverage rate as a result of the last series of rallies. Progress is compared to the situation prior to the initiation of project activities as collected in the baseline survey. What makes the IEF's system possible is its population-based data collection approach. The basis of this is the roster which is maintained by the VHP with the support and assistance of the HSA. The roster functions in much the same way that a register does in a number of other community-based child survival efforts.

The basic roster format is presented in Appendix XII. Each household in a VHP's area having a pregnant woman and/or a child(ren) under six is entered in the roster. The date of birth of each child is entered. A space is provided to enter the vitamin A distribution to the recently delivered mother. The crucial information is the check indicating whether the child attended the last rally session; if not, there is a slot to indicate that a follow-up visit was made to the house and vitamin A distributed. This system makes it possible for the supervising HSA to quickly tabulate the coverage figures in a village after a rally.

The HSAs base their monthly supervisory visit to their VHPs on the latter's rosters. The HSAs abstract data from the rosters and enter it on a tally sheet which tracks the most important project indicators (Appendix XIII). Progress in reaching the project's objectives can be easily monitored and shared with the project staff, Village Health Committees and other local authorities. The data engender a spirit of competition as well as a sense of accomplishment and satisfaction, all of which serve as motivating factors for the workers (especially the volunteer VHP). The information system is viewed as a benefit rather than a burden and is obviously a vital management tool.

The roster-based information system also includes information on child deaths. According to VHP guidelines, a death of a child is to be indicated by drawing a line through the name in the roster and noting the date. However, more can be done with this potentially rich source of data. For instance, the number of child deaths should be counted and reported by the HSA at the end of each month. The project should also monitor the causes of infant and child deaths.

In addition, the roster could be utilized to track immunization status. Although Malawi has done a commendable job in achieving high immunization coverage rates, the roster could help to maintain the good record. This could be done by indicating all children who should have been fully immunized (i.e., over the age of 9 months) with a circle in the extreme right hand margin; when fully immunized, the circle would be filled in.

In a similar fashion, women of child bearing age in the household already enrolled in the IEF-supported project could be added to the roster and

signified with a square in the right hand column. When she had received her five tetanus toxoid shots, the square would be filled in. It would not present great problems for the HSA to tally at the end of each month the number of children and WCBA who should be fully immunized (the denominator) and the number that have been (the numerator), giving a fully immunized coverage rate. In addition, all the children with open circles and women with open squares would be reminded of the need to get their remaining immunization(s) at the next opportunity, usually during a home visit. Not utilizing the roster for such purposes is missing a golden opportunity to greatly enhance the immunization effort in the project area.

While the roster system that has been developed has served the project's needs very well, its broader application has yet to be developed. Most importantly, the potential for targeted "at risk" programming is there. By identifying those infants and children with special needs and focusing attention (services and education) on those households, referring to the health centers when required, the project will be able to achieve its objectives as well as have an impact on the infant and child mortality rates.

Despite the attractive features of the information system, a few problems were noted. The VHPs occasionally make incorrect entries (e.g., marking that a mother has attended a session but received a follow-up visit as well). Several of the HSAs continue to report inaccurately, submitting monthly reports that do not make sense (e.g., all mothers attended the rally session but X number were followed up). These problems must be resolved before any further modifications are made to the current system.

Just as the nutrition education component of the project has proved most difficult in terms of implementation, so too has it presented the greatest problems in reporting. How many times a day the mother feeds the child or whether the food served is energy dense is not easy to determine. There are currently no indicators that are being tracked to determine whether any progress is being made. The DIP mentions that another random sample survey will be conducted toward the end of the two-year project to ascertain if any change in the community's nutritional behavior has occurred.

The baseline survey did not collect data on nutritional status. It would have been interesting to know the percentage of under fives according to the Gomez classification² prior to the start of the project. Because the growth of a large portion of the under five age group in the project region is currently being monitored at regular mobile clinics, those "at risk" (i.e., not growing or in third degree malnutrition) would be specially monitored and their mothers given special nutrition education. It is doubtful whether any significant impact of nutritional status could be achieved given the chronic food scarcity in the area and the short duration of the project. However, it

² The Gomez classification is determined by weight for age. Those children falling between 75% and 89% of standard are mildly malnourished (1st degree); from 60% to 74% are moderately malnourished (2nd degree); and below 60% are severely malnourished (3rd degree).

would give an indicator that could be tracked and provide another means by which "at risk" programming could be done.

It is suggested that the development of several very focused messages on such priority topics as presented in the preceding section might make it possible to track behavioral change (e.g., mothers with children under three months who are or are not exclusively breastfeeding; pregnant mothers with children under two who do and do not continue to breastfeed; mothers with weaning age children who do and do not feed them the improved weaning food being promoted).

4. Collaboration

IEF has established close ties with the Ministry of Health structure in the project area and has communicated with the regional level officials as required. The OMAs and HSAs from the government's district health services are an integral part of the project; the Vitamin A Project could not achieve its objectives without their involvement. The project managers have also worked closely with the District Health Officers, Health Inspectors, Public Health Nurses and MCH Coordinators in Chikwawa and Nesanje Districts, keeping them informed and involving them in the training sessions.

The evaluation team noted the need for greater coordination between the Vitamin A Project and the monthly or bi-monthly mobile clinics conducted by the government or collaborating agency (e.g., mission). In one of the villages visited during the review, it was noted that a rally might be conducted several days before a mobile clinic. It would be more convenient for the women of the village if the two could be combined. Disrupting one day instead of two would decrease the time burden for the hard working women.³

Before the integration takes place with the mobile clinics, the IEF project would do well to study how the mobile clinics are done what their coverage is at present. Also, questions relating to antenatal services and tetanus toxoid coverage must be ascertained; can HSAs give TT to WCBA or must it be done by a Health Assistant? Any effort to link more closely with the mobile clinics must be done in close coordination with the Regional Public Health Coordinator.

While combining the rallies and mobile clinics sounds like the reasonable and efficient way of doing things, problems arise that make it difficult. The problem is who should be given vitamin A arises when some of those attending the mobile clinic come from outside the Vitamin A Project sites. In one case, the mobile clinic involved several villages, only one of which was receiving vitamin A. In another case, half (two clusters) of a large village (consisting of four widely scattered clusters) received vitamin A while the mobile clinic covered the entire community. The project management has not

³ Women in one of the villages visited by the evaluation team said that it took them five to six hours a day to fetch water: three hours walk to the source and back plus several hours of waiting.

yet decided on whether the vitamin A can and should be provided to the broader population.

One possible solution to the problem is to expand the project to include the population of the mobile clinics associated with the current project villages. This would reduce the resentment from neighboring villages or parts of villages which have heretofore been excluded from the Vitamin A Project activities. This problem has had a negative impact in one of the villages we visited; the chief of the village resides in one of the clusters not covered by the Vitamin A Project and, as a result, he does not provide the support required to make the IEF effort work properly.

There is also a need to increase collaboration with other non-governmental organizations working in the Lower Shire Valley. Being one of the most depressed and needy areas of Malawi, a great number of development agencies have operations there (including ADRA, World Vision, TALRES, Save the Children-UK, and a number of mission groups). A case of possible overlap was identified during the project review. One of the villages included in the evaluation had been visited a month before by another group also dispensing high dose vitamin A capsules. Fortunately, the IEF project identified the problem and withheld vitamin A from those who had received it from the other source. No one was able to identify the other group. This incident makes it imperative that IEF and district authorities (especially the respective District Development Committee) coordinate more closely with the other agencies involved in child survival efforts in the valley. It must be determined who is doing what, where. This will obviously have to be done through the office of the District Health officer, but it is thought that IEF could initiate and facilitate the matter. If the government and non-governmental resources were properly coordinated and rationalized, it is very possible that the districts in questions could be fully covered with a reasonable quality of health care for the vulnerable target groups.

5. Community Interaction

The success of the Vitamin A Project is heavily dependent on the cooperation of the community, especially its leaders. To begin with, a team consisting of the area Malawi Congress Party or MCP (political party) representative, an official from the district health office, someone from the District Development Committee and an IEF representative explains the community's role and responsibility in the project to the chief and the Village Health Committee members.

If the village's response is positive, the leaders are instructed on how to chose a VHP. The criteria for the VHP include the woman being literate and "being honest and of good character". Once several women are nominated, the entire village votes for the one they deem to be the best candidate. In several of the villages the evaluation team visited, the VHP was one of the four female members of the Village Health Committee.⁴ Three out of the five

⁴ It is mandated that Village Health Committees include four female representatives among its 10 members.

VHPs interviewed during the course of the project review were considered to be very good. The one village, where performance was lagging and the VHPs were not as motivated, had a problem with village leadership that could explain the problems. The chief of the village resided in one of the clusters not included in the Vitamin A Project. As a result, he never gave the effort his support and never encouraged the villagers to participate in the project activities. This helps explain why so few women attended the weekly nutrition education sessions. In other villages where a lack of support was a problem, all that is required is for the local MCP leader to visit the community and urge participation; no further problems are experienced. Traditionally, the villagers of Malawi are very obedient and do as their local leaders instruct.

A very encouraging sign in two of the three villages visited was the involvement of the traditional birth attendants (TBA); both had received training from the government. It was clear that they were considered important members of the village health team. The TBAs enjoy a high level of confidence with the women of the community and can be great assets to the VHPs in effectively carrying out project activities. In the third village, the VHP delivered most of the babies in the village but had not undergone TBA training.

Another positive aspect of the project was the low dropout rate among the VHPs in during the first year of operation. Four of the 78 VHPs (5.1%) trained are no longer functioning as community health workers. One died while two more got paid jobs (one as a school teacher, the other as a PVO worker). The fourth VHP moved from the village with her husband. This augers well for project sustainability, the next point of discussion.

6. Sustainability

Sustainability continues to be a priority issue and consuming topic in all Child Survival projects; IEF's is no exception. There are a number of ways the problem can be addressed. One is in terms of leadership and management. In the Vitamin A Project, Malawians have been given considerable responsibility. The only expatriate involved on an on-going basis is the half-time Project Director. There is a genuine sharing of the technical and management functions so that if required, the local staff could eventually assume responsibility for running the project with little or no decrease in effectiveness.

In terms of field staff, all the supervisory workers are part of the government's health infrastructure. Neither the OMAs or the HSAs receive any incentives from IEF for their involvement. They do receive per diem (standard government rate) for the pre- and in-service training, which amount to approximately six or seven days a year. While some of the HSAs may have concentrated their time and energies on the Vitamin A Project, they continue for the most part to do their normal job. If current national plans are realized, the number of HSAs will be increased 10 fold over the next five years, making it possible for them to do what is expected of them in the Vitamin A Project without neglecting other responsibilities.

The recurrent costs of staff, transport and commodities are minimal. Some things could be done to facilitate a smooth transition. For one, instead of having IEF procure the vitamin A capsules, arrangements should be made to receive them through the government. If they are not available, the reason should be determined. If the project is to continued once IEF is no longer associated with it, a regular supply of vitamin A within Malawi must be identified. This should not present a problem since vitamin A has been classified as an essential drug and should be available at the Medical Stores through the District Health Officer.

Incentives for the VHPs is another concern. At present, the project provides them with very little in the form of incentives: a uniform, soap, a badge, a pair of shoes. But even that would be too much to expect the government to provide if it were to assume control. The possibility of the community providing such incentives in the future should be investigated. It is suggested that IEF conduct a study on what motivates VHPs. During year two of the Vitamin A Project, the PCVs should hold focus group sessions with selected VHPs to determine what non-monetary incentives would stimulate them and the number of drop-outs in the future. If the IEF approach is to be expanded and adopted more broadly, it is essential for the project to know what motivates volunteers within the Malawian context.

The DIP says that the project's activities of vitamin A distribution and nutrition do not offer any scope for cost recovery. While this is true, if activities were added like ORT and simple medicine distribution, possibly some cost recovery could be introduced.

The issue of sustainability will not be answered by the Vitamin A Project. A more serious effort focused on process issues is required. This is discussed a the final section of the report, in terms of what might come next.

7. Finance and Budget

The DIP review raised a question about the project's high cost per beneficiary. It should be noted that IEF responded in a very short time to the request for a revised proposal. They did not have sufficient time to think through how they would change the project from a more broad based Child Survival effort to a more focused vitamin A project. The details were not worked out until they went through the DIP development.

The evaluation team agrees that a total budget of over \$700,000 (combined A.I.D. and IEF) for a two-year project focusing most of its energies on vitamin A supplementation to a population of only 42,000 is too high. Now that the project has been launched and seems to be operating effectively, it is time to consider how the project might be expanded and/or broadened. The project director is interested in considering the best way to do this. Several possibilities exist. One is to expand in areas adjacent to villages already being covered. This would resolve the problem of jealously referred to above. Another possibility is to add a fourth cluster of another 15 to 20 villages and 25-30 VHPs.

9/1

A third possibility is to increase the number of child survival interventions that the VHPs would be responsible for. According to what the VHPs told the evaluation team, they would welcome additional activities since they get "bored" only doing vitamin A distribution and nutrition education. As mentioned, the project has already become increasingly involved in immunization. Discussions with community members pointed to the serious problem of diarrheal diseases in the villages. One approach is to introduce ORT in the project villages. Packets could be provided to the VHPs by the HSAs. The VHPs could hold the supplies and distribute to mothers when their children have episodes of diarrhea.⁵ Such a revision in the project would, of course, require that the VHPs be trained in all aspects of ORT. If the VHPs had ORS and possibly chloroquine and aspirin, they might be able to charge very modest amounts and recover the costs of the medicines, thereby contributing to the sustainability of the effort.

A fourth very pressing need is child spacing. This could greatly enhance the effectiveness of the infection control and nutrition intervention by adding the third vital leg of child survival. The high parity and short birth intervals have a devastating effect on the health/nutrition status of the mothers as well as the infants and children. With support from the health infrastructure (for screening and supplies), the VHPs and their colleagues, the TBAs, could serve as contraceptive depot holders (for pills and condoms), thereby complementing and strengthening the most recent priority effort by the Government of Malawi. The increased acceptance and use of condoms could simultaneously reduce the threat of AIDS.

The issue to be addressed in this discussion is how much can we realistically expect the village volunteer, the VHP, to do? Overloading the person at the bottom of the service delivery system is one of the most common phenomena and mistakes in primary health care. The health volunteer at the community level who is assigned these multifarious tasks has been aptly referred to as a "skinny Hercules". However, in the case of the IEF-assisted Vitamin A Project, the population-based approach which already includes home visits offers opportunities for additional services at minimal increments of additional time and energy. Perhaps the additional responsibilities could be tried with those VHPs who have performed most effectively to date. The additional training and responsibility could be seen as a promotion and provide a means to maintain enthusiasm in the VHP cadre. For example, A VHP I would only do vitamin A capsule distribution and nutrition education; VHP II would do that plus immunization tracking and ORT; VHP III would do all that plus child spacing and maintaining a small stock of medicines.

Another concern raised by A.I.D./Washington was the line item in the budget to cover the relocation expenses of the project director. Because the project director is serving in a half-time capacity, A.I.D. thought that only a portion of the allocation was justified. IEF agrees to reprogram the amount as specified by A.I.D. Exactly how the funds will be reprogrammed will be

⁵ The homemade sugar-salt approach does not seem to make sense for this particular case because of the typical non-availability of sugar in most of the households in the valley.

decided once a decision is made regarding the expansion/broadening of the project.

8. Interaction with A.I.D./Washington

Several issues concerning the Child Survival/vitamin A funding, the project approval process and DIP reviews were raised during the course of the evaluation. First, there was confusion as to the source of the funds. While IEF was notified that their Child Survival proposal had not been funded, they were informed by the PVC Office that vitamin A funds were available and were invited to reorient the project so that it had a vitamin A focus. The grant letter (dated 22 August 1989) mentioned that the funds were part of support under A.I.D.'s Child Survival Program. The PVC Office has provided project oversight to this point, yet the Office of Nutrition has periodically involved itself in the project.

IEF expressed some concern about the DIP review process. To begin with, the DIP comments were not received by IEF until the end of June 1990, six months after the DIP was submitted and approximately nine months after the project was launched. In the case of a two-year project, this represents a significant portion of time available. Some of the DIP review comments have been taken into account by IEF, and the project modified accordingly. Others were found to be inappropriate or not pertinent. For example, it was mentioned that the DIP called for the distribution of vitamin A capsules (200,000 I.U.) to all children under six; the point was made that only half that amount should be given to infants between 6 and 12 months. In fact, the DIP mentioned in at least two places (p. 9 and 19) that this is what IEF planned to do. Another point requested IEF to modify the DIP so that all the mothers receive regular nutrition education. The DIP describes quite clearly that in addition to the quarterly rallies, there will be weekly sessions which all mothers are expected to attend plus visits to all the homes which will include nutrition education as well.

Finally, the hope was expressed that local interests could be involved more intimately in the Child Survival/vitamin A proposal review process. Malawi has one of the biggest A.I.D. health programs in all of Africa; this includes five Child Survival/vitamin A projects with a value in excess of several million dollars. The majority of these schemes are working in close collaboration with the public sector. As such, the Ministry of Health must clear these efforts. Concern is raised when a proposal that has received support from the mission and Ministry is greatly modified. This was the case with the IEF proposal. To facilitate matters, it is suggested that the following actions be taken:

- the mission receive a copy of the proposal review comments as soon as possible (by fax) so that they can have the opportunity to comment;
- the mission receive a copy of the grant agreement between A.I.D. and the PVO; and

1/6

- the mission receive a copy of the DIP (at least 1st draft) so that it can be involved in its development.

If these things were done, USAID/Lilongwe could assure that the PVOs' Child Survival activities were fully integrated and in accordance with national health plans as well as USAID-supported programs.

D. Recommendations

Based on their findings, the evaluation team recommends the following actions be taken by IEF to strengthen and expand the Vitamin A Project. These recommendations represent the most important suggestions derived from the mid-term evaluation and are discussed in greater detail in the body of the report.

Nutrition Education

- nutrition education targets should be revised and made more realistic;
- the nutrition education component should be redesigned to focus on a limited number of priority behaviors that should be changed;
- technical assistance in social marketing approach as applied to nutrition should be procured;
- a limited number of focused, scientifically developed and tested messages should be adopted;
- the nutrition education messages should be repeated in as many different ways as possible (including traditional dance, music, theater);
- a Nutrition Education Field Supervisor should be hired to support the improved nutrition education effort;
- nutrition education should be directed as much as possible to the "at risk" cases as determined by means of growth monitoring (including those in third degree as well as no growth);
- one or two easy to track indicators should be developed to be included in the information system;

Management Information System

- the VHP roster and HSA monthly reporting forms should be modified to include immunization (<1s and women of child bearing age) and deaths (<6);
- greater use should be made of "at risk" identification (using growth monitoring) and reporting;

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Collaboration

- IEF should collaborate more closely with the other PVOs having Child Survival projects in Malawi;
- IEF should work with the district authorities to collaborate and coordinate with all groups delivering primary health care in the Lower Shire Valley;
- Vitamin A Project rallies wherever possible should be held as part of the mobile clinics; and

Expansion

- IEF should finalize plans for broadened (adding Child Survival interventions) and/or expanded population coverage.

E. Future Considerations

IEF has made considerable progress in the vitamin A service delivery component of its Vitamin A Project within the first year of operation. They have developed a population-based approach which appears to lend itself to the delivery of a more comprehensive package of the most important child survival interventions. Assuming that the project is able to implement successfully the modifications that are detailed in this review, IEF will be in a position to consider a more extensive Child Survival effort at the conclusion of the Vitamin A Project.

To begin it might be best to describe in conceptual terms a possible approach that IEF might take in a follow-on project. The Vitamin A Project IEF is carrying out during the two-year period can be described as a "technical pilot project". That is, the current effort is demonstrating that the strategy of using community-based workers in association with the existing health infrastructure can improve the health status of the target population at the village level. In order to determine the efficacy of the approach, it has to work properly. This has resulted in IEF providing intensive management and support of the field activities.

IEF also is interested in "producing numbers" to satisfy A.I.D. which is concerned with presenting to Congress impressive service delivery figures (e.g., percentage of target population covered with vitamin A distribution or immunization, number of ORS packets dispensed). Much less attention is provided to the vital question of sustainability and how the strategy might be integrated into the government system. If the latter is made a priority, tradeoffs with results will inevitably have to be made. It is not possible to achieve spectacular targets and numbers while devoting a high proportion of time to the important organizational development issues which have to be addressed if the approach is to be carried on once the PVO departs.

Once the strategy has been developed to a point that it is ready to be expanded, a more sophisticated type of programming is required. This can be referred to as a "process pilot". This approach must cover a large population, possibly an entire administrative unit such as a district in Malawi. There would be two sets of objectives. One would involve service delivery issues, relating to immunization, ORT, child spacing. The other would involve institutional development and management issues, relating to such vital aspects as supervision, information systems, field support, and community involvement. Attention is focused more on how the services are delivered than on what and how many of the services are delivered. The management-related concerns or the "process" are studied and changes made that will improve service delivery in the future.

Based on this approach, it is suggested that IEF's next Child Survival effort be along the lines of the so-called "process pilot". It is possible to conceive of the organization choosing one of the two districts of the Lower Shire Valley (possibly the one with less NGO activity in the child survival field) and developing a project that would have as its primary goal the development of an effective service delivery capacity utilizing both the public and private resources available. IEF's inputs would involve such things as training (technical as well as management), development of an effective management information/reporting system, establishment of coordination mechanism for all the organizations involved in health in the district, improved logistical systems, and the institutionalization of community involvement. As in the case of the current project, VHPs would be selected and trained along with the HSAs who would support and supervise the VHPs. However, sustainability, instead of being a topic that is just mentioned, would be the primary focus of the effort. Special studies and operations research exercises would be carried out to determine the best way to proceed. Some examples of things that might be done include focus groups with village volunteers regarding incentives (i.e., what non-monetary benefits can be identified to keep drop-out rates low), trials of cost-recovery schemes for simple but essential drugs (e.g., ORS, chloroquine, aspirin, contraceptives), and the testing of a few simple child survival-related indicators that would be tracked monthly to determine program performance.

Such a follow-on project would be implemented through the District Health Office. At present the DHO is fully occupied by the press of every day affairs and crises. He must be made aware of what can be done at the community level. To establish a base for future discussions on what might come next, IEF should waste no time in showing the DHO what is taking place in the Vitamin A Project villages and assure that he understands the implications.

The follow-on project would cover a larger population and be concerned with the delivery of a package of child survival interventions that have the potential for reducing the high infant and child mortality rates in the project area. It would also fit neatly into USAID/Lilongwe's overall objective of strengthening the health system at the periphery. A.I.D. and the World Bank have plans to assist the MOH to increase the number of HSAs by a factor of ten (from approximately 500 to nearly 5,000) over the next five years. This will give the human resources required to carry out a strategy

CPA

similar to the one IEF has developed in the Vitamin A Project. But having the workers is not enough. They must be trained and systems established to ensure that they are effectively managed and supported. The additional HSAs are a necessary condition for improved MCH service delivery to the villages, but they are by no means sufficient. IEF's follow-on project could assist the Government of Malawi by providing the process/management inputs required to develop a model program/system in one district that would continue to function effectively after IEF leaves Malawi.

APPENDIX I

SCOPE OF WORK FOR
MID-TERM EVALUATION
MALAWI VITAMIN A AND NUTRITION PROJECT
OCTOBER 1990

1. Activity to be evaluated:

The activity to be evaluated falls under the International Eye Foundation's CS-V (Vitamin A) intervention grant from USAID/FVA/PVC, Cooperative Agreement # ORT-0500-A-00-9159-00. The life of the project extends from September 1, 1989 through August 31, 1991.

2. The Purpose of the Mid-Term Evaluation:

The purpose of the mid-term evaluation is to:

1. Assess progress of activities to date (9/1/89-10/1/90) to identify strengths, weaknesses and constraints in project design and implementation.
2. Recommend any mid-course corrections to enhance project implementation, and expansion of activities into additional areas and new intervention(s).
3. Outline possible future project activities and research priorities.

The end-users of the mid-term evaluation will be IEF headquarters and country staff. A copy of the mid-term evaluation will serve as the required A.I.D. annual report. The collaborative evaluation effort with Adventist Development and Relief Agency (ADRA) project staff will be a learning experience and may help reduce consultant costs. A draft of questions for the mid-term evaluation is attached.

3. Methods and Procedures:

The IEF estimates that an evaluator and team will require five working days in Malawi and an additional two days for report writing. (This estimate may change.) The team would interview project staff and review project documents and possibly finances. The team would meet with MOH officials at national, regional and district levels, and officials from the Agriculture Development Division (Ngabu ADD). Other meetings will occur with A.I.D., other area PVOs and multi-lateral agencies (MSF, WVI, FAO). If time permits visits to field sites would be made to interview GOM staff involved in project activities and to talk with Volunteer Health Promoters, and examine roster books.

At the conclusion of the data collection, the team will spend a day reviewing information, issues and develop recommendations. A draft document will summarize the findings

and will be presented to field staff on the final day. At that time staff will have the opportunity to make final comments and suggestions. The final document will be produced for distribution to IEF staff, MOH officials and others. IEF field staff may decide to arrange for a formal presentation to MOH officials.

The team should consist of a strong independent outside evaluator with experience in child survival and African countries. Additional members should represent the MOH HQ (Nutrition Unit), A.I.D. (Health Officer or delegate), ADRA representative, IEF representative (HQ). The team would be actively assisted by the IEF country ophthalmologist and epidemiologist.

Mid-term Evaluation Questions: Preliminary List

Administration

1. Is the MIS in place (personnel, accounts, reports)?
2. Are there any outstanding staff needs?
3. Is the Bethesda technical/management support sufficient?
4. Are appropriate policies in place (management, VAC, Trachoma and T.E.O.)?
5. Is the project budget on track?

Project

1. Are the outputs and indicators met? Are they appropriate? Do they require adjustment?
2. Is the schedule on track? Do they require adjustment?
3. Is the HIS working? Is the rally session delivery method appropriate? How can it be improved?
4. Can costs per beneficiary be determined?
5. How can the objectives be strengthened (in particular nutrition education)?
6. How can staff performance be improved? Are there any outstanding issues concerning HSAs, OMAS and other staff?
7. How can the performance of the VHPs be improved? Are the incentives provided appropriate?
8. Does the project address community needs? Are there issues concerning community demand of services not met?
9. Does the project address GOM/MOH (and AID) needs? How can collaboration with MOH be improved?
11. How can collaboration with other PVOs, multi-lateral agencies be improved?
10. What aspects of the project are sustainable (short and long term)? How can this be enhanced?
12. Can the project be expanded (by villages, VHPs, HSAs)?
13. Can additional interventions be implemented (malaria, EPI)?

14. How can IEF expand its program in the LSV in the future?
15. What role should IEF play in distribution of VACs and TEO for the LSV?
16. Are there future research needs?

APPENDIX II

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

COPY

July 5, 1990

Re: Mid-term Evaluation Guidelines for CSIV Projects

Dear Colleague,

At the Aliso Creek workshop for U.S. based PVO Child Survival project staff in 1990, PVO representatives again expressed appreciation for the importance of midterm evaluations in adjusting the direction and improving the performance of Child Survival projects. I want to share with you our views concerning the direction and scope of these evaluations which should be carried out between now and the end of September, 1990.

First, these evaluations should provide headquarters an opportunity to review personally with project field staff the progress that each project has made in the last eighteen months, and the potential of the project for reaching its stated objectives by the end of the project (September, 1991 or 1992). Now is the time to review problems and constraints within the project and revise strategies for overcoming these obstacles accordingly.

Second, these midterm evaluations should present an opportunity for you to involve people outside your immediate CS staff to provide them with a closer perspective of your project and its effectiveness. For example, you might wish to ask other PVO in-country Child Survival professionals, or local UNICEF or A.I.D. mission health staff to participate in your project evaluation. In particular, you may wish to obtain outside views on sustainability of project activities. You may wish to ask a MOH representative to take part in your evaluation. This is a time for you to obtain maximum input in order to make sure the priorities for action are clearly identified as you plan the next steps to be taken for the project to achieve its objectives.

Third, these evaluations should provide the basis for preparation of your second annual report and be incorporated into it. The forthcoming guidelines for the Second Annual Report are likely to include the following types of information:

1. Assessment of Effectiveness - Has there been sufficient progress in meeting stated objectives and yearly targets? How many infants, children and mothers have actually received CS interventions? Are targeted high risk groups being reached effectively?

2. Assessment of infrastructure supporting key Child Survival activities - Does the project have adequate staff to meet the technical, managerial and operational needs of the project? Do these staff have local counterparts? Does the local staff have the managerial and technical capacity to eventually take on the functions necessary to operate all project activities?
3. Technical Support - Has headquarters and external TA been adequate? What are future TA and headquarters technical support requirements in the time remaining in the project?
4. Information Systems - Is the project health information system being used for decision making? Do the indicators need refinement? Does the project need to conduct a survey?
5. Modifications to the work plan or budget - How does the rate of expenditures to date compare with the project budget? Can the project achieve its objectives with the remaining funding? Is there a possibility that the budget will be underspent at the end of the project?
6. Sustainability - What are project activities which could be sustained after project funding ends? Will any project activities be institutionalized by government, local NGOs, community or other means? Is there a demand in the community or in the health sector for the health benefits to be sustained? Does the MOH see this project as effective?
7. Recurrent Costs and Cost Recovery Mechanisms - Do the project managers have a good understanding of the human, material, and financial inputs required to sustain project activities? Can one distinguish between the resources which were needed for start up activities and the resources which will be required on an on-going, recurrent basis? Does the community agree to pay for any ongoing costs of preventive and promotive health activities? Is the Government prepared to assume any part of the recurrent costs?
8. Recommendations - What steps should be taken by PVO field staff and headquarters for the project to reach its objectives on time?

In the Second Annual Report Guidelines there will be a section for you to report on methodology, key findings and lessons learned from the midterm evaluation. We will also ask you to attach a copy of your midterm evaluation. The Second Annual Report will be due in October, 1990, the specific day will be announced later.

In conclusion, the purpose of the midterm evaluation is to help you to identify what is working well with your project and what areas need further attention. Technical assistance will be available on a limited basis.

Please call your project officer for any further information.

Sincerely,

Sallie Jones for

John McEnaney
Chief, Child Survival & Health
Bureau of Food for Peace
and Voluntary Assistance

APPENDIX III

Documents Reviewed

- Courtright, P., Trip Report: IEF Vitamin A and Nutrition Project/Malawi (VITAP Report, November 1989).
- Eldridge, C.R., communication dated 22 August 1989.
- Ferguson, D.C.E. and S. K. Stansfield, End of Project Evaluation, IEF Child Survival Grant (December 1988).
- IEF, Child Survival and Blindness Prevention Program for the Lower Shire Valley of Malawi - Country Proposal (December 1988).
- IEF, Malawi Vitamin A Project - Detailed Implementation Plan (Bethesda: December 1989).
- IEF, Project Description Summary - Vitamin A Intervention Program: Lower Shire Valley, Malawi (August 1989).
- McEnaney, J., communication dated 26 June 1990.
- McEnaney, J., communication dated 5 July 1990.
- McEnaney, J., communication dated 24 August 1990.
- Stansfield, S.K., IEF/Malawi Vitamin A Project - Management Information System Interim Report (VITAL Report, undated).
- Stansfield, S.K., Trip Report: Consultation to IEF/Malawi for Vitamin A Project Design and Planning of Pre-Project Activities (VITAP Report, August 1989).
- Stansfield, S.K., Trip Report: Consultation to IEF/Malawi (VITAP Report, October 1989).

103

APPENDIX IV

PERSONS CONTACTED

A.I.D./Washington

Sallie Jones Deputy, PVC Office

USAID/Lilongwe

Gary Newton Director, Health, Population, Nutrition Office
Mexon Nyirongo Program Officer, HPN Office

IEF/Malawi

Paul Courtright Project Director
Susan Lewallen Ophthalmic Technical Advisor
H.D. Mlozi Banda Training and Supervision Coordinator
Monty Mkona Bookkeeper/Office Manager

IEF/Bethesda

John Barrows Child Survival Coordinator
Jack Blanks Program Director

Peace Corps Volunteers

Sally Swan PCV, Chikwawa
Beth Rink PCV, Nsanje

Ministry of Health

Teresa Banda Nutritionist, Lilongwe
Gloria Khunga Regional Primary Health Coordinator, Blantyre
Dr. Jonkman Regional Health Officer, Blantyre

UNICEF

Gillian Knox Social Mobilization Officer, Southern Region
Alfred Mwenifumbo Asst. Program Officer (Health)

Nyasa Village, Chikwawa District

Chisambo Ophthalmic Medical Assistant
Nyamizinga Health Surveillance Assistant
Felesta Kholopate Village Health Promoter
Ms. Jimu Village Health Promoter
Village Headman and Village Health Committee Members

Nyanthumbi Village, Nsanje District

Chalichi	Ophthalmic Medical Assistant
Bagi	Health Surveillance Assistant
Dolika Peterson	Village Health Promoter
Alignet Vintura	Village Health Promoter
Traditional Birth Attendant, Village Headman and Village Health Committee Members	

Chabvi Village, Nsanje District

Judith Thombozi	Village Health Promoter
Traditional Birth Attendant, Village Headman and Village Health Committee Members	

APPENDIX V

Project Description Summary
INTERNATIONAL EYE FOUNDATION
VITAMIN A INTERVENTION PROGRAM: LOWER SHIRE VALLEY, MALAWI

The International Eye Foundation (IEF) is proposing the following modifications to the IEF's initial Child Survival Project Proposal for the Lower Shire Valley of Malawi. As requested by the 1989 Child Survival Proposal Review Summary, the revised submission will now be for a Vitamin A Intervention Grant as opposed to a Child Survival Program Grant.

The goal of the modified program is the reduction of infant and child morbidity and mortality in the Lower Shire Valley of Malawi through a measurable decrease in the prevalence of Vitamin A deficiency in the target population.

Key interventions will include:

- 1) The expansion and improvement of IEF's current Vitamin A delivery system to the indicated target population via mobile distribution units at the village level;
- 2) The development and delivery of a nutrition education package at the village level focusing on Vitamin A which will complement the Ministry of Health's current nutrition education efforts in the target area;
- 3) The development and implementation of a comprehensive Vitamin A health information system (HIS) including baseline data survey, appropriate data collection instruments, monitoring systems, ongoing analysis of data and evaluation of program interventions;
- 4) Curative care, including medical management and intensive nutritional therapy, for children suffering from advanced stages of xerophthalmia.
- 5) Continued collaboration with the MOH and other agencies in the Lower Shire Valley to promote maternal and child health and well-being through basic CS interventions.

In addition to the above interventions, IEF will utilize private resources to investigate the potential for fortifying Likuni Phala, a weaning food which is currently distributed throughout Malawi via health units and under-five clinics.

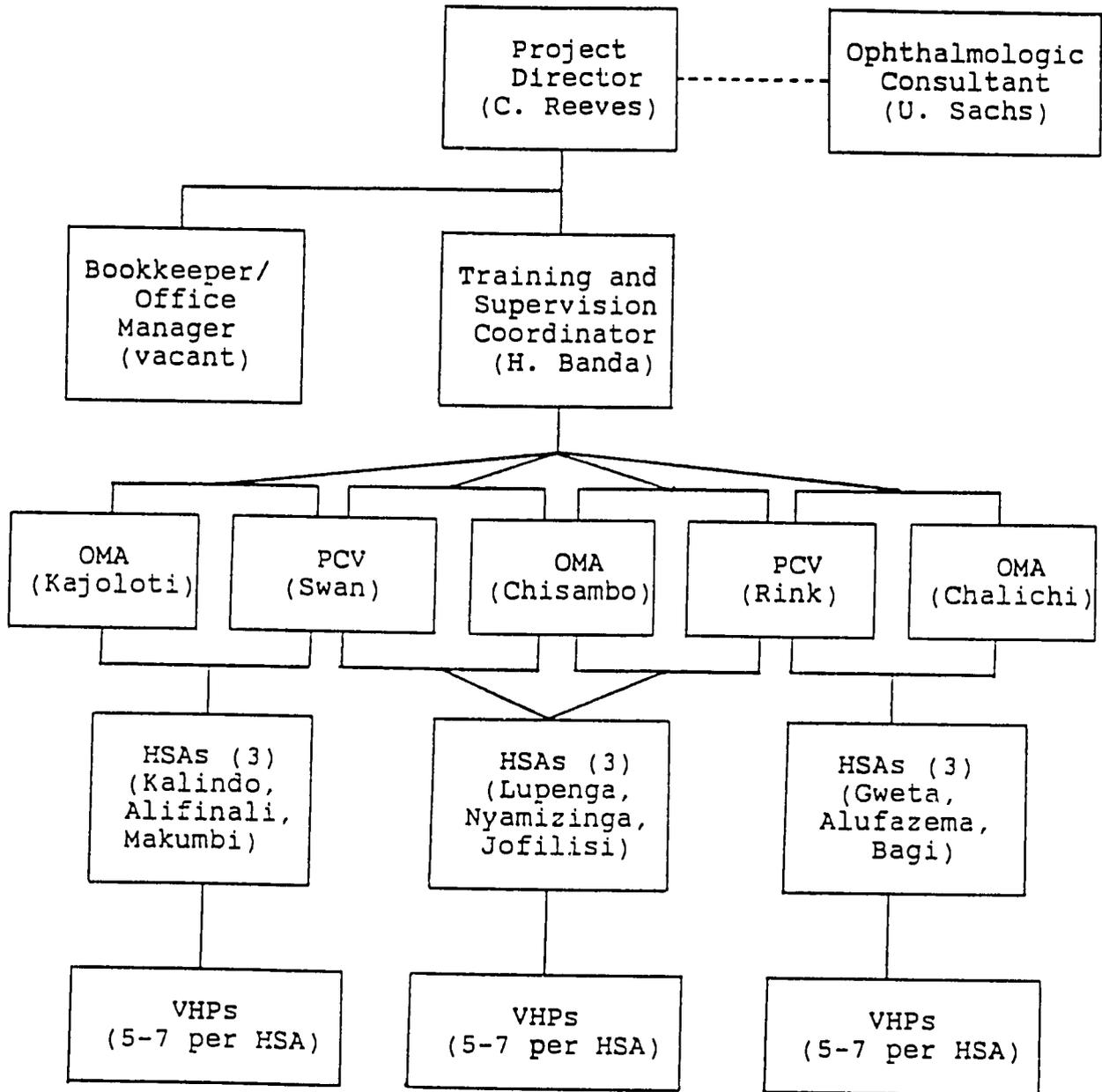
The beneficiary population for these interventions includes the estimated 210,000 members of the target groups (57% of the 366,000 estimated total population of the project area). These target groups include 90,000 children under the age of six (vitamin A supplementation) and 120,000 women aged 15-35 (nutrition education).

The project is designed for implementation over a two-year period, commencing July 1989, with total annual budgets (headquarters and field) of \$443,445 for year 1 and \$405,794 for year 2. Of the project total of \$849,239, an amount of \$529,819 is requested from USAID. The balance will be provided by IEF resources totalling \$219,420 and additional resources outside of USAID and IEF contributions (MOH, etc.) estimated at \$100,000.

101

IEF/MALAWI VITAMIN A PROJECT

Organizational Diagram



1/2

APPENDIX VII

Task Description for the Health Surveillance Assistant

1. The HSA will assist in the training of the VHPs from their area. Specifically, the HSAs will meet in small groups with their VHPs and conduct the post test, and lead the discussion of nutritional sources of Vit A in their areas and ways the VHPs feel food supplementation can be introduced and encouraged.
2. After VHP training the HSA will visit each VHP village within two weeks to encourage roster preparation. If the roster has not been started, the HSA will assist the VHP in initiating the roster. He HSA will ensure that a full roster is completed within 4 weeks of completion of VHP training.
3. The HSA will conduct periodic meetings of all VHPs in their region. The HSA will direct the 1-2 hour meeting by first conducting a health/nutrition education class (as designed by the IEF training coordinator and assisted by the PCVs). The first meeting will start within six months of VHP training. Afterwards, the HSA will elicit questions and comments from the VHPs and identify problem areas and topics of interest for future meetings. The HSA will prepare a short checklist regarding the meeting. The checklist should include the attendance, health education topic, any problems and topics of interest. This will be given to the TSC. VHPs will be given a bar of soap or some other incentive as well as return transportation costs.
4. Every month the HSA will visit each VHP in their village. At this time, the HSA will restock Vit A capsules. According to the support checklist (monthly report) the HSA will review the roster with the VHP. The monthly report should be submitted to the TSC and reviewed with the project director. The HSA will assist the VHP in assessing the adequacy of the diet of children or mothers that failed to attend the previous session. The HSA will fill in the monthly report for each VHP.
5. Every two months the 9 HSAs will meet in a central location with the training coordinator to review educational objectives, discuss additional methodologies and current problems.
6. The HSA will attend the quarterly mass Vitamin A campaigns in each village. During this time, the HSA will conduct a health education session and assist the OMA and VHP.

APPENDIX VIII

Teaching Materials Prepared for HSA & VHP Trainings

Breast feeding is important for good nutrition
Frequent feeding and feeding with vitamin A rich & energy dense foods is important
A talk on vitamin A promotion
Some barriers to changing poor feeding practices
How ca a VHP help in the prevention of blindness
Topics for nutrition education in the villages
Proper feeding practices for children <4 months
How ca a VHP and villages prepared for roster
VAN project objectives, indicators and survey results
Learning how to conduct periodic meetings
HSA tasks
Pre and post tests
Frequency and content of supplemental foods
Calendar (seasonality) of vitamin A rich vegetables and fruits
Codebook for roster
Codebook for supervisory check list
List of vitamin A rich foods
Nutrition education
Primary eye care
End of training evaluation
Mass campaign procedures
How to conduct nutrition education
Helping VHPs start and check the roster
Suggested reading material (for IEF staff)

Task Description for the Village Health Promoter

The tasks to be done by the VHP are as follows:

1. The VHP will create a roster (by household) of all children <6. Pregnant women will be identified. Women who become pregnant will be added to the roster. Infants delivered will also be added to the roster. The roster will include the following information:
 - A. Session attendance for children <6 and pregnant women (with sufficient space to include standard 6 month intervals).
 - B. Vit A supplementation to mothers within 2 months of delivery

2. The roster will guide the VHP in their tasks. As such, the VHP will:

I. VIT A SUPPLEMENTATION TO CHILDREN <6

- A. Within eight weeks of completion of the roster, the VHP, in coordination with the HSA, OMAS and a PCV, administer one Vit A dose (mass supplementation) to each child less than 6 years of age.
- B. At quarterly intervals thereafter, administer Vit A at the village mass campaigns. The VHP will be responsible for the distribution of the Vit A dose and record session attendance on the roster.
- C. Follow up visits to children and mothers who did not attend the mass campaign.

II. VIT A SUPPLEMENTATION TO MOTHERS WITHIN 2 MONTHS OF DELIVERY

- A. Identify women who have delivered and administer Vit A within 2 months post-delivery.

III. SUPPLEMENTAL FOODS

- A. Identify whether women are feeding their infants (4 mo to 6 years) supplemental foods.
- B. Determine how many supplemental feedings per day are being done. Encourage four or more feedings per day.

IEF/Malawi Vitamin A Project DIP

- C. If no supplemental foods are being given to the child identify whether Vit A rich and energy dense foods are eaten by the rest of the family. If so, encourage feeding of the child.
- D. If no supplemental foods are being given and Vit A rich foods and energy dense foods are not in the family's diet encourage the addition of available Vit A rich foods to the child's diet.
- E. Encourage women with infants less than 4 months of age to breast feed only.

VHP Training Objectives

The training objectives (capital letters) and details are listed below:

THE PROJECT OBJECTIVES AND RESULTS OF THE SURVEY

IMPORTANCE OF VITAMIN A & SOURCES OF VITAMIN A

1. Vitamin A and its contribution to eye disease and blindness
2. The contribution of Vitamin A to other childhood diseases and potential mortality.
3. Vitamin A capsules: frequency and role
4. Food sources of Vitamin A

THE IMPORTANCE OF BREAST FEEDING FOR NUTRITION

1. Malawi should be proud because almost all mothers breast feed their babies for a long time
2. Breast feeding protects babies from infection
3. Babies should be put to breast immediately after birth
4. A child should be breast fed on demand during the day and night. The more the baby breast feeds the more milk the mother produces.
5. Breast milk alone is the best food and drink for babies until they are 4 months old. Nothing else should be given before that age.
6. Children should be breast fed until they are at least 2 years old.
7. It is safe for mothers who are pregnant to breast feed.
8. It is almost always safe for mothers who are sick to continue to breast feed. If a mother is forced to stop for a few days she can start again if the baby suckles frequently.
9. Any mother who has a breast feeding problem should consult a health worker.

THE IMPORTANCE OF FREQUENT FEEDING & FEEDING WITH VITAMIN A RICH & ENERGY DENSE FOODS

1. Breast milk alone is not enough after the age of 4 months. Other foods should be introduced gradually.
2. Children aged around 4-6 months should be given a mixed phala that includes many different available foods. They should continue to breast feed often.
3. Young children should be fed frequently because they have small stomachs and so cannot eat much at one time.
4. When babies are aged about 6-8 months they should be fed at least 4 times a day and continue to be breast fed often.
5. At around 8 months a child can eat more solid foods in addition to weaning foods and breast milk.
6. Food for a young child (weaning foods as well as solid foods) should be put on a separate plate. If the child eats from the same plate as the rest of the family, the child may not get enough.
7. Young children should be given snacks between meals to make sure they eat frequently. Good snacks are boiled potatoes, sweet potatoes, cassava, fruit, carrots, mango, papaya, chiponde (ground

- nuts), and chikonda-moyo (mixture of sugar, soda and flour).
8. The greater the variety of food young children eat the better they grow.
 9. Children should continue to be fed when they are ill.
 10. Children with diarrhoea should have plenty to drink and continue feeding and breast feeding. Children with diarrhoea often die because they do not drink enough.
 11. After an illness a child needs extra food to regain lost weight and strength.

EYE DISEASES

1. Children with conjunctivitis (red, with exudate) or other eye problems should be sent to a health worker for treatment
2. Children detected with trachoma during quarterly examinations should be treated with tetracycline.

HEALTH EDUCATION, ADMINISTRATION & PROBLEM SOLVING

1. The roster should be maintained in an appropriate and up to date manner.
2. Appropriate health education is the best way to transmit Vitamin A and energy dense food information
3. By reporting problems and trying to problem solve solutions, appropriate methodologies for intervention can be developed.

APPENDIX XI

TRAINING GUIDE
FOR TRAINING VILLAGE HEALTH PROMOTERS
IEF SHIRE VALLEY VITAMIN A PROJECT

Topic	Time	Instructional Objectives	Methods & Teacher	Teacher Notes
MONDAY, 30 OCTOBER				
1. Opening Comments	8:00-8:15am	Open meeting	Dr. Van Dijk (DHO/Chikwawa)	1. Before opening the course, a packet of material for each VHP should be prepared. The packet should include a pen, the roster, small notebook and badge with name.
2. Project Introduction	8:15-9:00am	Project objectives & indicators Survey results & implications	C. Peeves (lecture)	2. VHPs: Thanks for their interest; selected because they were the best. Project is 2 years; don't take notes; instead, participate. Training is goal oriented; may require workshops later.
3. Pre-test	9:00-10:00am	To learn what each VHP already knows about Vit A deficiency & appropriate nutrition	H.M. Banda (pre-test)	3. Explain how to take test; This is more of a group effort than questions addressed to individuals
Break	10:00-10:15			
4. Vit A & Blindness	10:15-11:15am	Why Vit A is important Blindness can be prevented VHP role in blindness prevention	H.M. Banda (discussion)	4. Tell us what is Vit A deficiency--who is at risk of blindness and why, how you detect it. Better to prevent or cure? and how prevent it; is it seasonal?, which seasons? and why? Why didn't we measure it during survey?, discuss distribution in world, prevalence to be public health problem; suggested that giving Vit A can reduce mortality--why? how is it stored? how long can it be stored?, what does fever do to storage?, need energy rich to bind
5. Role of VHPs in project	11:15-12:00am	Who are the VHPs How the VHPs can prevent blindness	H.M. Banda (discussion)	5. VHPs' place in community; why are we involving you? What tasks can VHPs undertake?, how much of your time can we reasonably use? Discuss VHPs responsibility to community
Lunch	12:00-1:30pm			

119

Topic	Time	Instructional Objectives	Method & Teacher	Teacher Notes
MONDAY, 30 OCTOBER				
6. Vit A Capsules & food sources	1:30-2:30pm	To learn the food sources of Vit A To learn the capsule frequency & dosage	H.M. Banda (demonstration)	6. What are the food sources of vitamin A? How much Vit A is in nsima (you have to eat nsima the size of a house to get enough Vit A) How often should a child eat Vit A rich foods? recap seasonality (make a calendar) of Vit A; Vit A units (200,000 in capsule - children 11-71 mo, 100,000 for children 6-11 mo), frequency?
7. Roster for Vit A distribution	2:30-3:30am	To learn the use of VHP roster	H.M. Banda (demonstration)	7. Describe the purpose of the roster; why important to keep accurate; what their role is in roster preparation. Do some practice filling them out. Have a couple filled out incorrectly; find the error.
Break	3:30-3:45pm			
8. Mass Campaigns	3:45-5:00pm	To learn the purpose of the mass campaigns	H.M. Banda (role playing)	8. Major goal is supplementation by mass campaign; important to get good turn out; how? Go over plan and roles for mass campaign; planning required before. Start date, communication procedure; what to do if <5 clinic day; team fails to show. If all roster not done, do at mass campaign

Topic	Time	Instructional Objectives	Method & Teacher	Teacher Notes
TUESDAY, 31 OCTOBER				
1. HSA role in roster preparation	8:00-9:00am	To learn how the HSA will assist in roster preparation	H.M. Banda HSA (practice)	1. In what way can the HSA assist you? What problems do you see in preparing the roster? Set up a day with the HSAs that you'd like to start. Role play how they would start a roster. How would they ensure that all houses were done; what they would do if the village was big.
2. Ensuring good turnout at campaign	9:00-10:00am	To learn how to get mothers to come with children to campaign	H.M. Banda (demonstration)	2. How can you make sure that most mothers and children will come to the mass campaign? Who should do the announcement? If your village is large, should you have half days in different parts? What to do if it has to be changed and who should be informed?
Break	10:00-10:15			
3. Primary eye care	10:15-10:45am	To learn the parts of the eye and what to do for complaints	L. Chisanbo (lecture)	3. Talk about conjunctival (white part of eye) changes, corneal (clear part) changes; what they should do if they see them. Also talk about trachoma, conjunctivitis and neonatal conjunctivitis
4. Appropriate feeding practices	10:45-12:00am	To learn what is appropriate feeding for children (4 mo) To understand barriers to changing poor feeding practices	H.M. Banda (discussion)	4. Tell story of 2 children (one who got weaning foods too early, other after 4 months) Why did one child get sick and the other not? Why do people feed children supplemental foods too early? What are the barriers to changing this practice? How would they tell their friend about changing this practice?
Lunch	12:00-1:30pm			

Topic	Time	Instructional Objectives	Method & Teacher	Teacher Notes
6. Review of Vit A & Roster Preparation	1:30-2:00pm	To review sources of Vit A To review how to prepare roster	H.M. Banda (discussion & role playing)	6. What are the various sources of Vit A?; practice filling out a roster; practice checking a roster, review the plan of activities for mass campaign Draw a calendar of when certain vegetables/fruits are available. Discuss drying--better in shade than sun.
7. Different recipes for Vit A rich foods	2:00-3:00pm	To learn how to prepare different Vit A rich foods	H.M. Banda (demonstration)	7. Have Vit A rich food for lunch. What are some different recipes that children like that include Vit A rich foods? What recipes would you create during the "dry season"? What is the best way to transmit this information?
Break	3:00-3:15pm			
9. Appropriate feeding practices for children	3:15-4:15pm	To learn what is appropriate feeding for children >4 mo To understand barriers to changing poor feeding practices	H.M. Banda (lecture & discussion)	8. Tell story of two children (one who got fed nsima only, other with variety of food) Why did one child get sick and other not? Why do people feed children only one food?; What are the barriers to changing this practice? How would they tell their best friend about changing this practice?
10. Frequency and content of supplemental foods	4:15-5:00pm	To understand that children need to eat 4+ meals per day To understand that children need variety in their diet	H.M. Banda	9. How many times do VHPs eat per day?--are they still growing? How much per meal (big stomach) What about children (how big is stomach?) How many times do they think a child needs to eat per day? (at least 4). Tell story of two children, one stuffed with nsima + little bit of other stuff 3 x per day (too full to eat), one getting more feedings per day and more than nsima. What kinds of foods can be added? What is the family eating? Make sure child has separate plate.

Topic	Time	Instructional Objectives	Method & Teacher	Teacher Notes
WEDNESDAY, 1 NOVEMBER				
1. Appropriate nutrition education in the village	8:00-9:00am	Learn the best way to teach nutrition to village women	Mrs. Zigona (Chikwawa Hospital)	1. Guest speaker
2. Energy dense foods	9:00-10:00am	Learn the role of energy dense foods Learn which are most available and inexpensive	H.M. Banda (discussion)	2. What are energy dense foods? Why do we need them? Do children need them more? Why? Which are most available and when? What is the cost? Are they generally on adult's plates? Children need their own plates. Give results of survey.
Break	10:00-10:15am			
3. Review of appropriate nutritional practices	10:15-11:15am	Review	H.M. Banda	3. Review of appropriate nutritional practices
4. Periodic VFP meeting meetings	11:15-12:00am	Learn what is expected periodic meetings Establish logistics	H.M. Banda (discussion)	4. Every 2 mo need to get together with other VFPs and have nutrition education session. Also chance to have them discuss their progress. How would they set up their sessions: where? when? how get people there? (problem solve)
Lunch	12:00-1:30pm			

Topic	Time	Instructional Objectives	Method & Teacher	Teacher Notes
6. Integration of VHPs into community	1:30-2:30pm	Role the VHPs play in improving health & nutrition of community	Mrs. Maganga (Chikwava Hospital)	6. Guest speaker
7. Review & selection of new VHPs & health committees	2:30-3:00pm	Review of support practices and supervisory check How to select new VHPs	H.M. Banda (discussion & practice)	7. What will you do if village is huge, and new VHP is needed (villagers must recognize it as a problem and come up with solution) Liaison with Mr. Banda to get that person trained. Village health committees are key to success. We think all the VHPs are great. Support is from the village-- responsible to village. Schedule visits with HSAs and village committees.-- ask how programme can be improved.
Break	3:00-3:15pm			
8. Small vegetable gardens	3:15-4:00pm	Learn how to start start small village vegetable gardens	Miss M'untha (guest speaker)	8. Guest speaker
9. Diarrhea	4:00-5:00pm	Learn how to teach mothers what to do if a child has diarrhea	H.M. Banda (discussion)	9. Diarrhea is common--what is the cause of diarrhea? How do mothers treat it? What are the barriers to changing how mothers treat diarrhea? How do we get mothers to continue feeding their children? What is the best format for teaching about prevention of diarrhea

12

Topic	Time	Instructional Objectives	Method & Teacher	Teacher Notes
THURSDAY, 2 NOVEMBER				
1. Problem Solving	8:00-9:00am	To learn how to problem solve	H.M. Banda (discussion)	1. Present a number of examples of problems in the course of their work (lost roster, bad weather, sick VHF, angry mother, death in the village) and problem solve. Set up referral network for eye problems. 2. Review any outstanding issues. 3. Same test as pre-test; observe and ask if anyone is having difficulty taking test. Test checked by PCVs. 4. Review up-coming schedule of trainings and set up preliminary schedule of village visits. Go over results of post test; elaborate on any area that test results indicate lack of knowledge 5. Have certificates and incentives ready.
2. Summary	8:45-10:00am	To review any outstanding issues	H.M. Banda P. Courtright	
Break	10:00-10:15am			
3. Post-test	10:15-10:45am	To learn how much the VHPs have learned	H.M. Banda (post-test)	
4. Dispersal of supplies & review of post-test	10:45-11:15am	To disperse supplies and review post-test	H.M. Banda (discussion)	
5. Ceremony	11:15-12:00am	Awarding of VHP certificates and close of training programme	Mr. Barrows	
Lunch	12:00-1:30			

APPENDIX XII

Roster of Families with Pregnant Women and Children Under 6

Name of Mother	Name of Child	Child's Birthdate	Vit-A to Mother	Session Attendance and Follow-up Visits to Homes							
				1stQuar	2ndQuar	3rdQuar	4thQuar				
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126

HSA MONTHLY REPORT

HSA: _____ Month/Year: _____

Name of VHP and Date of visit:							

# Households:							
# Children <6							
# Children <6 at at last session							
# Follow-up visit							
# Infants <12 mo							
# Mothers (with infants) given vitamin A:							
# Pregnant women:							
# Capsules given to supply VHP:							
# Home visits with VHPs:							
Observations:							

128