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field guide for adding vitamin A interventions to PVO Child Survival projects

Recommendations for Child Survival Project Managers

DORIS STORMS AND JOHN QUINLEY, EDITORS

Report of a Special PVO Child Survival Task Force on Vitamin A
Baltimore, Maryland 1988

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On September 9, 1988, the Task Force on Vitamin A Components of PVO Child Survival Projects convened in Baltimore, Maryland, at the PVO Child Survival Support Office, The Johns Hopkins University, Institute for International Programs. The purpose for calling this special task force on vitamin A was to obtain practical, field-based suggestions to guide Child Survival project managers in the assessment of need, design, operation, management, and evaluation of vitamin A intervention activities. The meeting resulted in a broad scope of recommendations for vitamin A components that are consistent with existing standards for selecting objectives, indicators, and activities for other key Child Survival interventions. These recommendations and suggestions serve as a guide to PVO Child Survival project staff working in communities throughout the developing world.

Acknowledgments

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The guide is strengthened by the use of a number of tables from publications of the International Vitamin A Consultative Group (IVACG); we are grateful to IVACG for their use. Lastly, it would not have been possible to bring this field guide to publication without the assistance of Frank Glover, Martin Garcia-Bunuel, Shirin R. de Silva, and the Office of Design and Publications, The Johns Hopkins University.

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PVOs and Child Survival

Private voluntary organizations (PVOs) have proved important agents of development; PVO private resources committed to international programs have grown to over $1.8 billion. There is significant potential for the private voluntary community to work in partnership with local government to improve the health status of families. Indeed, with the stimulus of the Child Survival initiative, there has been an accelerated strengthening of the capacity of PVOs to design and implement community health and nutrition projects. Many PVO Child Survival projects are located in high-risk areas for vitamin A deficiency. Increasingly, PVOs located in such high-risk areas have become interested in adding vitamin A intervention activities to their program activities, as vitamin A prevents nutritional blindness, is necessary for proper childhood growth and development, and is a factor in protection from certain infectious diseases.

As part of its work to redirect foreign assistance funds to address significant unmet basic nutritional and other human needs, the House of Representatives' Select Committee on Hunger has played a major role in this story of PVO Child Survival and vitamin A development assistance. The Select Committee on Hunger has been instrumental in helping get not only the initial Child Survival legislation, but also funding for operational vitamin A programs. These monies have had considerable impact. In just one example, 23 U.S.-based PVOs are now conducting low-cost, innovative Child Survival activities with a combination of monies from charitable donations and grant funding from the Agency for International Development, through the Office of Private Voluntary Cooperation, Bureau for Food for Peace and Voluntary Assistance. Taken together, these Child Survival projects are working to improve the lives of hundreds of thousands of children under 5 and their mothers in 25 countries.

Of the 74 projects funded in the first five years of AID/FVA/PVC's competitive Child Survival grants program (1985-89), approximately one-fourth now include, or are planning, vitamin A interventions. These 74 central A.I.D.-supported projects are certainly not the entire universe of PVO Child Survival programming. Yet, as a group they do provide a sample of the lessons learned by PVOs as they undertake significant expansion of Child Survival operations in developing countries. While it is too early to speak of the lessons learned in those Child Survival projects that

have incorporated vitamin A activities, a few basic approaches have emerged.

In general, PVOs have found it desirable to integrate vitamin A service activity with other key Child Survival interventions. This is much more efficient and cost effective, in most cases, than delivering vitamin A interventions alone. PVOs have learned that it is essential to obtain assistance from individuals or organizations with strong technical background in vitamin A deficiency when doing mass surveys to document the extent of the deficiency problem. PVOs have also found that technical support early in project development enhances the quality of vitamin A programming and increases the likelihood of successful integration with other key health and nutrition interventions.

PVO Information Needs

What types of technical support are most needed? Child Survival project managers report that field staff need assistance in strategic planning, technical design, and analyzing effectiveness of the added vitamin A component. They request practical, field-based recommendations on how to add interventions that will be effective in influencing vitamin A status in their designated Child Survival impact areas.

PVO Child Survival projects are given extensive guidelines for the key interventions of immunizations, oral rehydration therapy, nutrition, and birth-spacing, which govern development of the project proposal, the detailed implementation plan (DIP), annual reports, and midterm and final evaluations. To date, they have not had similar guidelines for vitamin A intervention activities. That is unfortunate. PVOs often attract highly motivated generalists, usually lacking in the more specialized health-related disciplines. PVOs are also the job choice of many new entrants to international health work. It is precisely for such people that guidelines are most helpful.

PVO staff have requested recommendations regarding vitamin A interventions that are consistent with existing standards for selecting objectives, indicators, and activities for other Child Survival interventions. PVOs do not want a collection of vertical programs. They seek an integration of interventions that make sense to, and are desired by, those in the community. Thus it seemed that a field guide, based on the collective practical experience gained in PVO Child Survival projects, could best aid PVO project managers in assessing needs, setting objectives, selecting interventions, and assessing performance of a vitamin A component within an overall Child Survival program.

The Lake Havasu Workshop

The first step was to identify the information needs of the technical staff of PVOs who are currently administering Child Survival grants. At a Child Survival workshop held at Lake Havasu, Arizona, in January 1988 for U.S.-based PVO staff who backstop country projects, a technical resource person was provided to respond to participants' inquiries about prevention and treatment of vitamin A deficiency.

The following questions were raised and discussed either during the prepared remarks or during the discussion period that followed:

(1) Why is vitamin A singled out for discussion?
(2) What is the relationship between vitamin A deficiency and infection (i.e., the degree of causality, if any, in the relationship)?
(3) What are the risks and benefits associated with vitamin A dosing?
(4) How can PVOs know recognize that vitamin A deficiency is a problem in the area that they serve?
(5) How does a PVO convince the appropriate country health authorities that vitamin A interventions are needed?
(6) Can a PVO use an existing health delivery system to integrate delivery of vitamin A?
(7) What is the target group for vitamin A interventions?
(8) What is an appropriate vitamin A action plan to add to a Child Survival project?
(9) How can vitamin A capsules be procured and how should they be stored?
(10) What training and educational materials about vitamin A are available for field personnel?
(11) How can existing growth charts be used to monitor dosage of vitamin A?
(12) How does a PVO monitor and evaluate a nutrition project designed to change knowledge, attitudes, and practices regarding vitamin A intake?
(13) Is it realistic for PVOs to use morbidity/mortality indicators to evaluate their vitamin A interventions?
(14) Why can't blood levels of vitamin A be used to evaluate vitamin A deficiency?
(15) What is conjunctival impression cytology?
(16) What process indicators can be used to evaluate progress toward meeting the objectives of the vitamin A component?

Task Force Purpose and Expected Outcomes

Following the Lake Havasu workshop, a PVO representative suggested that a logical next step would be to "set up a task force to focus on each intervention with members of appropriate PVOs and appoint a facilitator to keep it on track." This assignment fell within the cooperative agreement which The Johns Hopkins University has with the Office of Private Voluntary Cooperation, Bureau for Food for Peace and Voluntary Assistance, Agency for International Development, to provide implementation support to PVO Child Survival grantees. With permission from A.I.D., plans were made for a special task force to be held on integrating vitamin A interventions into Child Survival projects, with the expectation that the group would develop recommendations for use by PVO project managers. This group convened on September 9, 1988, at The Johns Hopkins University Institute for International Programs in Baltimore and generated a broad array of recommendations consistent with existing standards for Child Survival objectives, indicators, and activities.

Task Force Participants

Seven persons constituted the Task Force. (See Annex 1 for listing.) Three PVOs with Child Survival and vitamin A grants each agreed to send one representative recently returned from a field program: Helen Keller International, Save the Children Federation, and World Vision Relief and Development, Inc. Two other members, qualified health professionals, were formerly employed in PVO field projects with vitamin A interventions. The sixth member, a pediatrician and public health professional, had carried out an assessment of vitamin A deficiency in Guatemala as part of a two-year assignment on the implications of vitamin A for Child Survival, an assignment that had brought him into contact with U.S.-based PVO Child Survival projects. The seventh participant, an epidemiologist, had assisted the Office of Health, USAID, with the development of A.I.D.'s framework for monitoring and evaluation of the effectiveness of Child Survival programs in developing countries, and had taken part in the evaluation of a Child Survival project of the International Eye Foundation and a vitamin A project sponsored by EYECARE. The PVO Child Survival Support Program office was responsible for organization, including travel, lodging, and production of the final report.

The Nature of Vitamin A Interventions

Before proceeding to the recommendations of the Task Force, it may be useful to review some theoretical considerations of vitamin A interventions, including the relationship of overall Child Survival goals to vitamin A strategies and the practical considerations of the features, costs, and benefits of the various vitamin A interventions suited to integration into PVO Child Survival projects.

1. Theoretical Considerations

The eventual goal of all PVO Child Survival projects is to reduce morbidity and mortality of infants and children in a sustainable manner. Vitamin A interventions may contribute to this in several ways. There is clear evidence that vitamin A interventions can reduce the incidence of xerophthalmia, which leads to childhood blindness; furthermore, associations have been documented between vitamin A deficiency and a higher risk of diarrheal and respiratory infections. There is also evidence that vitamin A interventions may reduce childhood mortality. Although further research is required to determine the full extent of the benefits of vitamin A in preventing childhood morbidity and deaths, PVOs with Child Survival projects located in high-risk areas for vitamin A deficiency should consider adding a vitamin A component to their projects, under the assumption that reducing vitamin A deficiency may reduce morbidity (certainly in the form of xerophthalmia) and/or mortality.

The goals of vitamin A interventions are the restoration of vitamin A stores in situations of depleted bodily reserves (severe deficiency with chronically low intakes, protein energy malnutrition, or eye signs) and the maintenance of these stores in situations of dietary scarcity. Interventions which may be used by PVOs in the restoration and maintenance of vitamin A stores include a variety of vitamin A dosing strategies; maternal, health worker, and school nutritional education; mass media campaigns; the stimulation of vitamin A-rich fruit and vegetable production; feeding programs; and nutrification (the fortification of local foods with vitamin A preparations). Interventions aimed at maintaining rather than replenishing stores are inappropriate in the treatment of severe vitamin A deficiency in a child, and the converse is also true. Careful situational analysis is necessary before specific interventions are chosen. Tables 1 and 2 in Annex 5 may prove helpful

in determining which intervention(s) to choose.

2. Practical Considerations

2.1 Training, Education, and Mass Communications

2.1.1 Training of community health workers
Modules involving vitamin A-specific interventions should be integrated into the PVO's general training program. The first step in community health worker training is the training of the trainers, whether these are health care workers or single purpose health educators, who in turn will train the actual community health workers or volunteers. The main considerations here are that there should be set objectives of expected outcomes of each training session, that the training should be directed to the performance of a limited number of specific tasks, that it should require maximum participation by the trainees themselves, and that it should be evaluated to see that the workers did learn what was taught and can perform at the level expected. The length of the training period is dependent upon the educational background of the trainees involved and on the number and the complexity of the tasks which they will be expected to perform.

2.1.2 Community-based education
Community-based educational interventions include programs centered around mothers groups and school or church educational programs. Again, training should be highly specific. Community-based education should concentrate on only a few messages, should be understandable to the group, should be practical in nature, and should be directed to what a person can do. That is, the training should be action-oriented. Community discussion of the ethics and values expected should be encouraged. The benefits of any educational initiative take years to accrue, but the effects of such interventions are long lasting.

2.1.3 Mass communications
The strength of a radio, newspaper, or TV campaign lies in its ability to create a desire for a service or product, rather than in its ability to educate. Mass media campaigns, if used in conjunction with and in support of one-on-one interactions with mothers or caretakers, are effective in changing family health behavior. However, field experience has shown that community-level interventions are more effective than mass media alone.

Another consideration is that the vehicle of mass communications used must be available to the people whom the PVO wishes to reach; that is, illiterate people will be unaffected by newspaper campaigns, and poor people will usually not possess TV sets and

may not have access to radios. The cost of a media campaign can be high, especially if it is necessary to conduct a survey in order to tailor the message to a specific community. The effects of mass campaigns are short-lived, but whatever benefits will accrue are quickly achieved. There have been some good experiences with PVOs and mass media campaigns in Indonesia.

2.2 Agricultural Intervention

Agricultural interventions are intended to promote the production (and ultimately the consumption by target populations) of vegetables, fruits, or animal sources containing vitamin A or its precursors. Increased vitamin A consumption is usually only one part of the overall nutritional goals of food production programs. Agricultural approaches suited to PVOs are interventions on the family and community level, such as growing vitamin A-rich foods in garden plots at homes and in schools. The advantages of the agricultural approach are that family members acquire nutritional knowledge, the project requires some commitment from the family in order to be successful, the costs are low, and the effects long lasting. Some problems with this approach include apathy, lack of available land or water, the physical labor involved in tilling or irrigating the soil, plant loss through disease or theft, and the sale or barter of the crop in preference to its use in feeding young children. No benefits would be seen for months to years, but while the intervention initially is moderately expensive, its continuing costs are low.

2.3 Dosing Strategies

Interventions involving dosing strategies require individual contact between the deliverer and the recipient at specific times, and so need organized logistics and significant numbers of personnel. Examples of situations in which these requirements may be met include clinics, feeding programs, hospitals, and refugee camps. In most countries, vitamin A capsules may be obtained from UNICEF in the form of a 200,000 IU capsule with 40 IU vitamin E. Procurement involves a formal request by the host government to UNICEF for a specific number of capsules. (There are exceptions, however; the government of India, for example, provides vitamin A concentrate manufactured and distributed in 100 ml bottles in-country.) While a cold chain is not required, vitamin A needs to be stored in a cool area, away from direct sunlight. The benefits of vitamin A dosing strategies are immediate, but the effects are temporary, requiring continued dosing at regular intervals. (The lengths of the dosing intervals are dependent upon the initial dosage used.) All vitamin A interventions relying on dosing strategies should be

accompanied by educational interventions, so that mothers or caretakers understand the need for the child or woman to continue taking the dose.

Three different kinds of vitamin A delivery systems have been effective:

2.3.1 High-dose treatment in a health facility

High-dose vitamin A treatment of children presenting to a health facility with overt signs of vitamin A deficiency, or with other illness and consequent high risk of overt vitamin A deficiency, is the most effective way of improving vitamin A reserves over the short term. If the existing Child Survival project is affiliated with a hospital or health clinic, start-up and continuing costs involve only moderate expense.

2.3.2 Clinic-based supplementation

This targeted approach covers high-risk groups within the general population and is appropriate for Child Survival projects which operate in collaboration with a Ministry of Health or the PVO's own clinics or health centers. An example of this might be routine vitamin A supplementation of those enrolled in feeding programs and/or attending maternal and infant health clinics. If vitamin A supplementation is added to existing clinic-based Child Survival activities, start-up and continuing costs involve moderate expense.

2.3.3 Community-based supplementation

This involves a universal distribution system in which all non-pregnant, lactating mothers and preschool children in a given region are dosed at set intervals by single or multipurpose community workers. This approach does not require higher-level health care workers, but does require significant numbers of trained persons who can devote time to traveling about the project impact area to reach every member of the target group. If the supplementation can be added to an existing community health worker home visit program, this intervention involves moderate expense but requires good supervision, worker transportation, and adequate documentation and records system. Unless there is a proper record of who should obtain the vitamin A supplement, and who actually does receive the supplement, a Child Survival project should not attempt this approach.

2.4 Nutrification

Nutrification, or vitamin A fortification of locally available food, requires the organization involved to discover, by a survey, what foods or food ingredients are eaten by a broad cross-section of the population at risk. Initiating this kind of program requires people

who are skilled in food science, survey design, food production and distribution, and advertising. The initial cost is high, but the continuing costs of nutrification are low. A drawback to this intervention is that it will take months to achieve any benefits. Few PVOs will be able to participate in the national policy process leading to nutrification.

Only foods with the following characteristics are candidates for nutrification:

(1) There is a central location for processing and for distributing the food.
(2) The food possesses a processing stage which will permit the vitamin to be added.
(3) The vitamin may be depended upon to remain stable and bioavailable in that food. For example, nutrification of cooking oil would result in vitamin denaturation when the oil is heated.
(4) The taste, texture, and flavor of the food remain unchanged by the addition of the vitamin.
(5) The food is cheap and is consumed by the poor. Nutrification of refined sugars, for example, would not help those most in need.

Recommendations to Project Managers Regarding the Addition of Vitamin A Components to PVO Child Survival Projects

Introduction

The recommendations of this technical task force are divided into six sections:

(1) Assessing the need for a vitamin A intervention in the CS project area.
(2) Setting measurable objectives for vitamin A interventions.
(3) Selecting the target populations for vitamin A interventions.
(4) Choosing appropriate objectives, target populations, and performance indicators by type of vitamin A intervention, some examples.
(5) Incorporating vitamin A information into the Child Survival project proposal, detailed implementation plan, annual reviews, and midterm and final evaluations.
(6) Making information available to Child Survival project staff on vitamin A deficiency and design of community-level intervention programs.

1. Assessing the Need for Vitamin A Interventions

1.1 Secondary Data Sources

PVOs considering the addition of a vitamin A component to their Child Survival project should first check available data sources documenting the possible extent and the severity of vitamin A deficiency in the communities where the PVO is working. The extent of vitamin A deficiency will determine whether or not a vitamin A component is practical; the severity will determine the type of intervention used. The PVO could review secondary sources such as international, national, and local published information, including special studies done in the project area.

1.1.1
WHO and UNICEF are relatively good international sources of published information on the vitamin A deficiency problem in a particular country. However, the PVO should know how these organizations derived the national or regional classification of vitamin A status for the specific country or region with which it is concerned, as the original data is of variable quality. Sources of data include surveys of eye signs, as well as serum retinol, history

of night blindness, dietary histories, and case reports. Such data may or may not be good evidence of vitamin A deficiency in a project area.

1.1.2

National and local sources of information may also be available. Some countries already have national policies for vitamin A programs, which may dictate components of a CS project. National surveys are useful, but vitamin A deficiency can be highly variable within a single country. Local surveys or case reports of xerophthalmia may be useful, but unfortunately are seldom available, as the diagnosis is rarely made. (For example, in the 19 countries where serious vitamin A deficiency is considered by WHO to be a significant public health problem, the apparent prevalence in children 6 months to 6 years of age ranges from five per 1,000 to five per 10,000, depending on which eye sign is surveyed.)

1.1.3

The absence of reports does not necessarily mean that there is no vitamin A deficiency problem. Information as to cases of vitamin A deficiency-related eye disease may be gathered from structured interviews (interviews conducted in person with the aid of vitamin A specific questions) with village headmen, key public health personnel, and the directors of schools for the blind, pediatric clinics, eye clinics, and hospitals. Personal contact is usually essential, and the interview should ideally be conducted by a senior health worker. Hospital records may also provide useful information, assuming the records system has been well designed and maintained; but this method of gleaning information is extremely time consuming. If the PVO gets data from schools for the blind, it should bear in mind that only survivors can be institutionalized, and xerophthalmia kills a large number of its victims.

1.1.4

If secondary sources give reasonable direct or indirect evidence of significant vitamin A deficiency in the project area, a vitamin A intervention component can be justified. Also, if dietary information from the vulnerable age group documents chronically inadequate intake, an educational intervention can be supported.

1.2 PVO Documentation of Existing Vitamin A Deficiency

If secondary sources of information are inadequate to justify vitamin A interventions but the PVO still wishes to pursue adding this component, the CS project will need to document the presence of vitamin A deficiency. In most cases, the PVO Child Survival project should not do this on its own. PVOs wishing to carry out

baseline data collection should have strong technical background in the area, or request technical assistance in developing and administering a survey questionnaire and or in physical examinations of children's eyes.

1.2.1

The primary reason why the PVO Child Survival project should not attempt to assess levels of vitamin A deficiency on its own is that evidence of such deficiency will be difficult to obtain, as the evidence is

(1) technically difficult to gather (e.g., serum retinol)
(2) so rare that it requires a very large population to measure accurately (e.g., signs of xerophthalmia)
(3) subject to biases in mass surveys (e.g., night blindness for which no word may exist in the local language)
(4) still under experimental development (e.g., conjunctival impression cytology)

1.2.2

Therefore, any PVO that wishes to provide good documentation of vitamin A deficiency should either have strong technical background in conducting surveys or request technical assistance from individuals or organizations having this experience. To illustrate some of the complexities in survey analysis, Annex 2 discusses issues in selecting the size of the sample needed to determine whether or not vitamin A deficiency is a problem in a particular population.

1.3 Baseline Survey and Physical Examination

PVOs that have already justified a vitamin A component for their Child Survival program through secondary data, and have sought assistance in devising a baseline household survey and/or physical examination of targeted children, may wish to include questions on night blindness in children, breastfeeding practices, use of vitamin A-rich foods by mothers and children, and home garden production. In the physical exam the health worker should check the child's eyes for the presence of Bitot's spots, corneal lesions, or corneal scars. This promotes surveyors' awareness of vitamin A issues and health workers' knowledge of how to recognize signs at the beginning of the project at little additional cost. In most cases, the funding available to Child Survival projects for a baseline survey is relatively small. Such a survey may not give an objective measure of vitamin A deficiency in the population, but even limited evidence may be useful.

2. Setting Measurable Objectives for Vitamin A Interventions

2.1 Reduce Vitamin A Deficiency

The same problems that make vitamin A deficiency difficult to document in the first place also complicate measurements of the effect of vitamin A intervention on childhood morbidity or mortality. Therefore, the Task Force recommends that PVO Child Survival projects consider that the goal of adding vitamin A intervention activities is simply to reduce vitamin A deficiency, with the assumption that this in turn may reduce morbidity (certainly in the form of xerophthalmia) and/or mortality.

2.2 Avoid Objectives to Reduce Morbidity or Mortality

The PVO Child Survival project manager should avoid setting objectives of the vitamin A component which are linked to morbidity and mortality. If signs or symptoms of vitamin A deficiency are measured in a baseline survey, they will most likely be measured again in a follow-up survey. However, the potential for measuring an effect of vitamin A intervention on morbidity or mortality in a relatively small population by this means is fraught with error.

2.2.1

Xerophthalmia is rare and a large population is required to measure an effect accurately. Numbers of cases of reported night blindness can be spuriously changed by increased awareness of vitamin A deficiency issues. Any increase or decrease in rates of xerophthalmia is likely to be uninterpretable in many Child Survival projects, and these morbidity measures should not cause the PVO to neglect the more important measures of project inputs and coverage.

2.2.2

Diarrheal and respiratory morbidity vary so much from season to season and year to year, and are so linked to other Child Survival interventions, that no interpretable relation between morbidity and vitamin A intervention can be expected outside a rigorous research setting. Even if the project is tracking diarrheal and respiratory morbidity for other reasons, the Task Force does not recommend attempting to specifically link these to the vitamin A intervention.

2.2.3

Because childhood (12 through 59 months) mortality is relatively rare, detecting a change in mortality rates would require a large population and complete, accurate reporting of vital events (births, deaths). Furthermore, such a change is likely to be influenced by many factors other than vitamin A.

2.3 Select Objectives/Indicators Linked to Program Operations

Therefore, given the difficulty in measuring morbidity and mortality in relation to vitamin A intervention, the Task Force recommends that PVO Child Survival project managers set objectives and select performance indicators linked to vitamin A program operations. An example of this might be "to increase the absolute number and proportion of children in the target population who received vitamin A supplementation in the preceding six months." Another example might be to use changes in child feeding methods as measures of educational interventions.

2.4 Track Xerophthalmia Prevalence by Registration Systems

The Task Force recognizes that some PVOs have developed family registration systems permitting the field project to track vital events in the designated impact areas. Thus, if a Child Survival project is already assessing the impact of the project on morbidity and mortality, and if the project has included examination for eye signs and night blindness in its baseline survey, it may wish to attempt to measure the impact of vitamin A intervention on xerophthalmia prevalence, should it serve a population large enough to show a statistically significant effect.

3. Selecting the Target Populations for Vitamin A Interventions

The choice of a target population for a vitamin A intervention is influenced by technical, program, and safety factors:

3.1 Technical Factors

3.1.1
Vitamin A deficiency can affect children before birth and throughout childhood. Therefore, the target group may include pregnant and lactating women, infants, and children.

3.1.2
Vitamin A in high doses can be used to specifically treat eye signs where vitamin A deficiency is highly prevalent.

3.1.3
Vitamin A deficiency can be exacerbated by measles, and high doses may be prophylactically used in cases of clinical measles, in areas where measles is severe.

3.1.4
The effectiveness of high-dose vitamin A administered during episodes of diarrhea and pneumonia is controversial: the children absorb less vitamin A than other children, but unless severely

deficient, may still absorb enough to become toxic, especially in chronic respiratory or diarrheal disease. Therefore, at the present time, the Task Force recommends against the prophylactic use of high-dose vitamin A in chronic diarrheal or respiratory disease, but adheres to the recommendations of the International Vitamin A Consultative Group (IVACG) of a single supplemental dose in acute diarrhea or pneumonia.

3.2 Program Factors

3.2.1
If there is a national policy on vitamin A interventions with targeted groups, the PVO Child Survival project should match this policy and coordinate with government vitamin A programs, just as it would for other interventions.

3.2.2
Vitamin A interventions operate in concert with other child survival and development activities. Therefore it is reasonable that the vitamin A target population may be influenced by plans for other interventions.

3.2.3
Vitamin A interventions vary and include nutritional and horticultural education, high- or low-dose supplementation, treatment of xerophthalmia, and fortification programs. The target group that should be reached depends to some extent on the intervention chosen.

3.3 Safety Factors

3.3.1
The preferred and safest vitamin A intervention is to improve the diet. In some cases, however, this is not a practical short-term solution, and the strategy of choice is supplementation. Here, the only medical risks are for interventions using high-dose liquid or capsule vitamin A. The recommended dosage schedule should not be exceeded in women, infants less than 12 months of age, and anyone with advanced liver disease. This should be avoided in women, because women treated with high doses of vitamin A in the first trimester of pregnancy are at risk for bearing infants with a variety of blood disorders and bone deformities. High-dose vitamin A should be avoided in infants, because young infants are unable to properly metabolize the vitamin in high doses (due to their immature livers). And high dosages of vitamin A should be avoided in anyone showing signs of advanced liver disease (yellow eyes

and skin), because people with advanced liver disease do not have the liver capacity to metabolize the vitamin in these quantities. Remember, caution is needed. (Signs of hypervitaminosis include drowsiness, fever, irritability, vomiting, and severe headache. If an infant has an open fontanelle [soft spot], the fontanelle may bulge. If the vitamin is discontinued, these signs will usually cease.)

3.3.2

Therefore, we recommend that the dose of vitamin A supplements should be lowered for all pregnant women, or women at risk for pregnancy, for infants aged less than 12 months, and for individuals with severe liver disease. The PVO should follow the host country guidelines on exact dosages, or obtain them from the current technical literature, if national policies on vitamin A supplementation and treatment do not exist. PVO project managers should be thoroughly familiar with the recommendations found in the IVACG and World Health Organization resource documents listed in Annex 3. The necessary addresses are listed in the glossary.

4. Choosing Appropriate Objectives, Target Populations, and Performance Indicators by Type of Vitamin A Intervention, Some Examples

4.1 Existing PVO Child Survival Programming

PVOs are a great resource for extending coverage of services directed toward reducing vitamin A deficiency. How the PVO functions will determine what type of vitamin A intervention is possible to add to the existing Child Survival approach. This is because no one type of organization characterizes the PVOs which implement Child Survival programming. However, they can roughly be grouped into three main categories with regard to the extent of the PVO's expertise and functioning in the health sector.

4.1.1

The first category includes those PVOs involved in active delivery of health services (whether general medical services or eye care services), working from their own fixed facilities, whether it be hospital or health center. Such PVOs usually employ well-trained health professionals to carry out the Child Survival interventions and provide access to referral services for more specialized care.

4.1.2

The second group is comprised of those PVOs primarily involved in strengthening government health services through provision of education, training, and outreach to high-risk groups. Working in collaboration with the Ministry of Health, they may train and

deploy community health workers (or volunteers) who carry out their assigned tasks under the general direction of the local MOH health clinic staff. Frequently there is a trained public health professional working in the project, though perhaps located in the capital center or PVO country office.

4.1.3

Those PVOs in the third category most often are interested in health as part of other ongoing community development activities (water, sanitation, preschool education), and concentrate their efforts on community action and promotion of better health practices. They seldom have a formal affiliation with a fixed health facility, and linkages to district and regional government health authorities may be weak, though strong to other government ministries. More often than not the project staff are generalists, though it would not be unusual to meet an educator or nutritionist managing the project.

4.2 Vitamin A Intervention Activities

Five basic intervention activities can be part of a vitamin A project component: nutrition education, food production, supplementation, treatment, and fortification. Any one Child Survival project might include one or several of these activities.

4.2.1

The type of vitamin A intervention activities chosen should be compatible with other Child Survival interventions in the project.

4.2.2

Although many possible performance indicators are mentioned in the examples given below, the PVO project manager would be wise to select only the most essential indicators to monitor the progress of the vitamin A intervention activities. (Annex 4 provides examples of performance indicators that some PVO projects now use.)

4.3 Maternal Nutritional Education

Maternal nutritional education is one type of nutritional education intervention. One objective of maternal nutritional education might be to change maternal dietary habits to include locally available foods which are rich in vitamin A. Another objective might be to change breastfeeding practices of lactating women. A third possible objective might be to change feeding practices for the weaning-age child. In all cases the target group of interest is some sub-group of mothers.

4.3.1

The appropriate target population for maternal education would be those selected to receive the intervention. For instance, an educational program which encourages the giving of colostrum to newborns should be primarily interested in reaching pregnant women. Similarly, the program which emphasizes the consumption of vitamin A-rich foods by pregnant and lactating women should be restricted to such women. (On the other hand, a program which emphasizes appropriate weaning practices might wish to especially target mothers of infants less than weaning age so it might be possible to observe whether the educational practices make some difference when the child reaches weaning age.)

4.3.2

Performance indicators for a maternal education intervention include the materials prepared, the number of sessions held, the number of mothers in attendance, and the percentage of the target group contacted through the educational effort. These indicators could be obtained through the management information system. Information obtained through surveys could be used as indicators, such as the percentage of contacts remembering specific messages or the percentage of contacts reporting specific behavioral practices (i.e., giving colostrum to the newborn, preparing certain vitamin A-rich foods for weaning-age children, and adding fats or oils to the diet to aid absorption of vitamin A).

4.4 Health Worker Training

Health worker training is another type of nutritional education intervention. It may include education on the recognition of vitamin A deficiency as well as on dietary approaches to improving vitamin A intake.

4.4.1

The appropriate target group for this intervention might be community or village health workers, paramedical or medical personnel, or other health care workers, depending upon the project involved.

4.4.2

Performance indicators for an educational intervention with health workers may be output measures like materials prepared and numbers trained, quality measures like percentage of workers who can correctly repeat specific messages, or follow-up indicators which look at health worker performance following training. For example, follow-up indicators might include the number of children the workers subsequently screen or treat for vitamin A deficiency, or the number of home visits they subsequently conduct in order to encourage the consumption of vitamin A-rich foods and the

promotion of breastfeeding.

4.5 School Nutritional Education

School nutritional education is generally directed at changing specific dietary behaviors.

4.5.1
Targets may be teachers or school children of various ages (for example, ages 6 to 10 years).

4.5.2
Performance indicators for school education intervention are similar to those for maternal education: extent of program activities (the number of sessions held and of children in attendance), the percentage of the target group remembering specific messages, and the percentage reporting specific behaviors (such as the consumption of certain vitamin A-rich foods by children on a weekly basis, or the incorporation of vitamin A nutritional education into school curricula by teachers).

4.6 Mass Media Interventions

Mass media interventions are generally used in support of some other intervention, usually a face-to-face intervention such as maternal education, or clinic-based distribution of vitamin A capsules.

4.6.1
Targets are specific subgroups of the population. For example, if a mass communication campaign is being used in support of a program of maternal education to promote better infant and young child feeding and weaning practices, the target population could be defined as all women with children under 18 months of age.

4.6.2
Performance indicators for mass communication campaigns may be obtained through surveys and could include the percentage of contacts who remember the message or who modify their behavior in response to the message.

4.7 Family Food Production

Family food production interventions are typically garden projects, though other means of production of vitamin A-rich foods can be considered, such as egg production and small fish farms.

4.7.1
Food production interventions can be divided into those which provide only educational support (the need for certain foods and

how to grow, harvest, and prepare them, etc.) and those providing material support (seeds, etc.). Gardens may be home, school, or community based. Moreover, these programs may be used in tandem with nutritional education efforts.

4.7.2

The target population in this intervention is composed of the gardeners or food producers.

4.7.3

Performance indicators for food production interventions may be the number in the target population contacted and educated, the percentage of occurrence of targeted foods in gardens (for example papayas, carrots, dark green leafy vegetables), or the reported percentage of children eating garden foods containing vitamin A.

4.7.4

Performance indicators for logistical assessment of food production interventions might be the availability of affordable, easily grown seeds or plantings that produce culturally acceptable, vitamin A-rich foods. The availability of water and compost for soil enrichment might also be assessed.

4.8 Supplementation Interventions

Vitamin A supplementation interventions involve either high-dose or low-dose supplementation. High-dose supplementation consists of dosing with 200,000 or 100,000 unit capsules or liquid concentrate, two to four times a year depending upon the technical recommendations, or on government policy regarding dosage schedule. Low-dose supplementation consists of dosing with 10,000 unit tablets no more than once per day. In general, low-dose supplementation is reserved for women of childbearing age.

4.8.1

The objective of giving doses of vitamin A is to prevent deficiency should insufficient vitamin A be eaten or absorbed. This may be a problem related to maternal diet during pregnancy and lactation, to weaning practices, to seasonal variation in food availability, to lack of money to purchase vitamin A-rich foods, or to the incidence of infections such as measles and severe diarrhea.

4.8.2

Targets for vitamin A supplementation are usually infants less than 1 year of age, children ages 1 to 6 or less than 110 cm in height, lactating women, and pregnant women. Target group limits for any particular project should be in accordance with government policies, technical recommendations, and other Child Survival

interventions. Dosage schedules vary and should follow established policy or current recommendations for safely improving vitamin A status. Table 3 of Annex 5 gives current recommendations and those safety considerations are repeated here.

4.8.3

The 1988 IVACG recommendations for use in dietary supplementation are as follows: For infants less than 1 year old, 100,000 IU vitamin A orally every three months beginning a few weeks after birth. For children ages 1 to 6 or less than 110 cm in height, 200,000 IU vitamin A orally every three months are recommended. For lactating women, 200,000 IU vitamin A orally once during the first two months after delivery. For pregnant women, no more than 10,000 IU per day during the first half of the pregnancy or, if necessary, 100,000 IU orally once during the last trimester of pregnancy. Specific guidelines for patients with severe liver disease are unavailable, but they may be treated according to the schedule for children under 1 year old.

4.8.4

Performance indicators for vitamin A supplementation may be the number of capsules distributed and/or the percentage of target groups covered. An example of this might be the percentage of infants less than 1 year of age who received vitamin A supplementation, or the percentage of children between 1 year and 10 years of age who received a high dose during mass campaigns. Indicators may be obtained either from the health information system or from surveys at the household level. Growth charts may be usefully employed as a source of data if a large "A" is recorded on the growth chart during the months in which the child receives supplementation.

4.8.5

Performance indicators for a logistics assessment might be the amount of vitamin preparations on hand, the storage of capsules or liquid away from the light, the storage of preparations between 0°C and 30°C, the presence of date labels on opened liquid containers, and the disposal of liquid vitamin A which has been open for more than two months. Another kind of performance indicator might be the completion of the community mass dosing campaigns according to the recommended schedule for the program year.

4.8.6

It is essential that the PVO identify and document all vitamin A supplementation activities conducted by the government and other agencies in the project area. This allows standardization of family-

retained records and minimizes the chance of children receiving multiple doses through overlapping programs. It is especially important to avoid this in high-risk areas where health programs have undertaken high-dose supplementation interventions.

4.9 Feeding Interventions

Feeding interventions involve the nutritional rehabilitation of malnourished children. In this context, vitamin A is simply one nutrient among many the child may need. It should be noted that the distribution of powdered, non-fat dry milk (NFDM) can either help or hinder efforts to promote vitamin A. NFDM from United States sources has had restored the vitamin A that had been lost in the fat-removal process. NFDM from EEC sources is virtually vitamin A free. U.S.-based PVOs involved in collaborative distribution of food-stuffs from international sources should be aware of the vitamin A content of the food which they provide.

4.9.1

The target group for feeding interventions is the same as that for the overall nutritional rehabilitation effort.

4.9.2

A performance indicator might be the percentage of the target group receiving adequate vitamin A during a specified period of time.

4.10 Treatment Interventions

Treatment interventions involve giving high doses of vitamin A to individuals with specific conditions and treating eye involvement due to vitamin A deficiency.

4.10.1

The objective of treatment interventions is to prevent eye disease, to limit eye damage, and to increase chances for survival under high-risk conditions of malnutrition and infection.

4.10.2

The possible target groups include

(1) individuals with ophthalmologic signs or symptoms of active xerophthalmia (night blindness, Bitot's spots, corneal lesions)
(2) children with clinical measles
(3) special refugee disaster relief populations

4.10.3

Treatment with vitamin A for active xerophthalmia should follow national policy guidelines, or, in their absence, standard dosage recommendations, which are available from the WHO or IVACG.

Table 4 of Annex 5 gives current IVACG recommendations, and those safety considerations are repeated here.

4.10.4

The 1988 IVACG recommendations for treatment with vitamin A for active xerophthalmia are as follows: For children and adults over the age of 1 year the recommendations are 200,000 IU immediately on diagnosis, with another 200,000 IU the next day, and a further 200,000 IU one to four weeks later. The treatment recommendations for infants under 1 year of age are half the adult dose. Community health workers should also refer patients with eye lesions to an eye clinic for emergency treatment.

4.10.5

In addition, the 1988 IVACG guidelines recommend that severely malnourished children and adults should receive the full treatment with three doses of vitamin A, at 200,000 IU or 100,000 IU per dose, depending on age, even if they do not have active xerophthalmia. Malnourished children with active xerophthalmia may need a fourth dose at four to six weeks after onset of treatment, should they relapse. Children with measles or with acute diarrhea or acute lower respiratory disease should receive one supplemental dose at the time of diagnosis (Table 5 of Annex 5). In Africa, however, where measles is especially severe and vitamin A deficiency endemic, the full three doses of vitamin A should be given. Again, no specific guidelines are available for patients with severe liver disease, but they may be treated according to the schedule for infants under the age of a year (Table 4 of Annex 5).

4.10.6

An appropriate performance indicator for a program incorporating vitamin A treatment interventions would be the percentage of the target group treated according to recommendations. In cases of measles in high-risk areas, the indicator might be the number or percentage of children with measles who receive the appropriate dosage of vitamin A.

4.11 Nutrification

Some countries have begun or are planning national programs to fortify with vitamin A those foods commonly consumed by children in low-income families. Although few PVOs can participate in the national policy process, they can support such efforts.

4.11.1

Fortified foods should be added to the list of good vitamin A sources for the project locality. If the fortified food is not available locally, the PVO might arrange for it to be stocked in stores.

4.11.2
Families and shopkeepers are appropriate target groups for fortification interventions.

4.11.3
The number of local outlets for fortified foods, the sales figures for fortified foods, and the percentage of mothers or children at risk who report consuming fortified foods are all possible performance indicators for a fortification intervention.

5. Incorporating Vitamin A Information into the Child Survival Project Proposal, Detailed Implementation Plan, Annual Reviews, Midterm and Final Evaluations

5.1 Importance of Networking

As with all other Child Survival interventions, sharing information and collaboration with the government and other agencies should occur from the planning stage through the reporting, evaluation, and feedback to health workers and to the community about the progress with vitamin A interventions. This networking can cut down upon overlapping coverage of vitamin A target groups, duplication of program materials design, incompatible information systems, and misconceptions about the plans for sustainability of interventions.

5.2 Justification for Including Vitamin A

If a PVO wishes to include a vitamin A component in a Child Survival project, the country project proposal should discuss the evidence for a vitamin A deficiency problem in the impact area, cite sources of data, provide justification for including vitamin A intervention activities in the overall Child Survival proposal, and describe general plans for the type of vitamin A intervention, the objectives of the intervention, the proposed target groups, and the performance indicators. It should also demonstrate the relevance of the proposed vitamin A component to vitamin A policy and programs at the regional and national level.

5.3 Relationship to Other Key Interventions

The way in which the vitamin A component integrates with other Child Survival interventions should be stated explicitly in the proposal, even if the vitamin A component is being funded separately. The PVO should discuss possible constraints to adding this new component, indicate its potential impact upon existing deliv-

ery of other Child Survival interventions, and should propose strategies for overcoming constraints. It is important that the proposal be as realistic as possible in its objectives and indicate the resources of personnel, supplies, time, and money that will be needed to reach the objectives of the proposed vitamin A intervention activities by the end of project funding. The PVO should discuss the expected sustainability of proposed interventions.

5.4 Detailed Implementation Plan

The detailed implementation plan should review the justification for adding a vitamin A component, the type of intervention(s) selected; the planned objectives, targets, and indicators; relationship to other planned interventions; and the way in which performance indicators will be gathered. The DIP should describe the curriculum and the schedule for health worker training in the prevention and treatment of vitamin A deficiency. It should review plans for procurement of needed supplies. The DIP is also the place to explain the project's strategy for raising community awareness of vitamin A deficiency, and should describe the primary content of public education and social marketing messages.

5.5 Annual Reviews, Midterm and Final Evaluations

The annual reviews, as well as the midterm and final evaluations, should contain interim and final performance results obtained either from the project's management information system or from surveys. Project management should clearly note the "lessons learned" by the program, along with any changes made in the vitamin A component and its budget. If submitting an annual report to donors or head PVO office, it is desirable to include copies of any survey instrument and describe the methodology used to assess the vitamin A deficiency problem in the area.

6. Making Information Available to Child Survival Project Staff on Vitamin A Deficiency and Design of Community-level Intervention Programs

6.1 Field Access to Information

The Task Force recommends that PVOs intending to add a vitamin A component to a Child Survival project should have available, at the project's location, the following information:

(1) government documents on current vitamin A policy in the case where a national or regional program exists for the control of vitamin A deficiency

(2) technical information for the design, monitoring, and evalu-

ation of vitamin A interventions in communities or groups at high risk

(3) training materials for vitamin A interventions which are appropriate to the literacy level, the professional training, and the service role of project health workers

(4) a listing of locally available foods that provide vitamin A or are good sources of the fats or oils necessary for vitamin A absorption

(5) a listing of the sources and costs of garden seeds that will produce foods high in vitamin A and are appropriate for local soil conditions and local food preferences

(6) the most recent dosage schedule recommendations for prevention and treatment of vitamin A deficiency in nursing infants, children 6-11 months, children 12-59 months, and women in the childbearing years

(7) a listing of sources of vitamin A preparations together with their costs and a recommended protocol for the storage of vitamin A preparations

(8) documents and reviews on vitamin A deficiency

6.2 Responsibility of PVO Home Offices

PVO home offices should make every effort to see that country projects have the necessary information on site to guide implementation of vitamin A interventions.

6.3 Responsibility of Donors

A.I.D. and other donors should include information on the prevention and control of vitamin A deficiency as part of the technical attachments to the Request for PVO Child Survival Proposals. Unfortunately, this material may remain in the U.S. office to help in preparing the proposal. Thus, when notifying a PVO of country project grant funding, the donor should send the PVO another complete set of technical attachments on key interventions (including the prevention and control of vitamin A deficiency), with a request that the PVO forward them to the country project for use in preparing their detailed implementation plan.

6.4 Technical Assistance through VITAP

Helen Keller International has initiated the development of the Vitamin A Technical Assistance Program (VITAP) to provide timely technical support and a broad range of information to PVOs working on, or planning to initiate, activities in the field of vitamin A. HKI anticipates that, through VITAP, more PVOs will plan to add vitamin A components to their Child Survival activities in order to

help prevent nutritional blindness. Strengthening PVOs in service delivery, program design, and monitoring is an essential element to be addressed by the VITAP grant from AID FVA PVC.

6.5 Workshop Opportunities

Workshops are an important strategy in developing the human resources of organizations. Several PVOs have made Child Survival informational workshops key to proposal development, or to informing managers of newly funded projects about the standards and requirements they will be expected to meet. Field-based implementation support workshops for country national staff have been a key element of A.I.D.'s strategy for strengthening PVO Child Survival projects within the regions of Africa, Asia, and Latin America. Annual PVO HQ workshops in the United States also serve to improve networking and coordination among those who backstop Child Survival projects. Whenever appropriate, such workshops should include information on vitamin A deficiency, identify the lessons learned in implementing intervention activities, review results of performance evaluations, and highlight PVO resources for sustaining vitamin A and other Child Survival interventions.

Annex I

Task Force Members

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Monica Ortega, MD, MPH, Director of Education and Child Survival for Save the Children's Dominican Republic Operational Program Grant. Formerly with SCF Sudan (CSH), Dr. Ortega has been involved in formulating vitamin A guidelines for all SCF projects.

John Quinley, MD, MPH, Health Systems Analyst. Dr. Quinley worked for two years in the field for HKI Indonesia (CSD), and has assisted with several FVA/PVC-funded Child Survival activities.

Sally Stansfield, MD, Consultant for ISTI and the Office of Health USAID on the Child Survival reporting system. Recently returned from the World Health Organization, Geneva, where she designed programming for control of acute respiratory infection. Consultant for Eye Care Haiti, a vitamin A project funded by FVA/PVC, and for International Eye Foundation Malawi (CSD).

Jeff Watson, MAEd, Regional Manager for Asia at HKI HQ. Previously, Country Director for Helen Keller International in the Philippines.

Norma Wilson, MS, MPH, Facilitator for the Task Force meeting. Ms. Wilson has recently returned from a two-year assignment with the Haitian Child Health Institute where she worked as a Child Survival Fellow with both local and U.S.-based PVOs on evaluation of Child Survival activities in Haiti. Previously she carried out training courses in Africa for the University of San Diego.

ANNEX 2

Selecting Sample Size to Determine Prevalence of Vitamin A Deficiency

If one desires to determine whether or not vitamin A deficiency is a problem in a particular population, a survey may be undertaken. The Task Force strongly recommends that a PVO obtain experienced technical assistance in survey design and analysis. This annex on selecting sample size is included as an aid to PVO project managers working with a survey consultant.

To answer the question of how large a sample is necessary, three factors must be considered: 1) the estimated prevalence (i.e., commonness) of the condition sought, 2) the confidence level, 3) the interval of precision desired (i.e., the range of possible values of the true prevalence).

To address point number one it is reasonable to consider the World Health Organization's criteria for assessing the public health significance of xerophthalmia and vitamin A deficiency. The chart below is based on the prevalence among children less than 6 years of age in the community:

Criterion	Classification	Minimum Prevalence
Clinical		
Night blindness	XN	1.0%
Bitot's spots	X1B	0.5%
Corneal xerosis and	X2	
or ulceration	X3A	0.01%
Keratomalacia	X3B	
Xerophthalmia-related		
corneal scars	XS	0.05%
Biochemical		
Serum retinol (vitamin A)		
less than 100ug l		5.0%

(Source: World Health Organization 1982)

The confidence level refers to the certainty with which one would like to know that the true prevalence falls within the specified interval. It usually takes on values of 90%, 95%, or 99%. If the confidence level is 95% and the width of the desired interval is x,

then one can say that one is 95% confident that the true prevalence falls within the specified interval, x.

In the table below, the sample size necessary to determine prevalence of vitamin A deficiency with 95% confidence using the various clinical and biochemical criteria is tabulated below. Each column represents a given prevalence (P) and each row represents the width of the interval (D). For example, if D is 40% of the prevalence and the prevalence is 5.0%, then the sample size required to detect a prevalence of at least 5% and as great as 7% (5%+(40% of 5%)=7%) is 1,013. It should be noted that random sampling is assumed. If the sample is not selected in a statistically random manner, adjustments need to be made to the sample sizes given in the table.

Width (D) (As % of P)	**Prevalence (P)**				
	0.01%	0.05%	0.5%	1.0%	5.0%
10	8,525,574	1,704,427	169,165	84,411	16,200
20	2,131,386	426,107	42,414	21,103	4,050
40	532,847	106,527	10,605	5,276	1,013
50	341,056	68,177	6,787	3,376	648
100	85,255	17,044	1,697	844	162
200	21,314	4,261	424	211	41
300	9,474	1,894	189	94	18

Using the table above, consider the example in which the estimated prevalence of Bitot's spots in the population is 0.5%. If the population value is only 10% higher than the stated WHO minimum prevalence, enormous sample sizes would be needed to be 95% certain of obtaining a sample value significantly higher than the WHO value. If, however, the population value is as much as 50% higher (i.e., D=50) than the WHO value, sample sizes of about 7,000 (i.e., 6,787) would be sufficient to detect a prevalence of 0.5% or greater. Furthermore, population rates of twice (i.e., 200%) the WHO minimum standard or more could easily be shown to be as high or higher than the WHO minimums with sample sizes of less than 5000 even when the minimum rate is a low as 0.05%.

ANNEX 3

Useful References for Project Managers

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ANNEX 4

Examples of Performance Indicators to Track Progress of Vitamin A Interventions in PVO Projects

Objectives	Activities and Benchmarks
A. Vitamin A capsule distribution:	
Distribute high dose capsules two times a year to 60% of children 6 months to 6 years.	Give capsules during vaccination sessions and through regular outlets: - FY88: 25% of children, or approx. X capsules FY89: 50% of children, or X capsules FY90 until FY92: 60% of children or approx. X capsules/yr.
Distribute high dose capsules two times a year to 70% of children 6–10 yrs. in schools.	Periodically distribute through all the schools in the region: FY88: 35% of schoolchildren or approx. X capsules - FY89: 60% of schoolchildren or X capsules FY90–92: 70% of schoolchildren or at least X capsules/yr
Provide a one time dose to 70% of mothers giving birth in a health structure.	Distribute through midwives and others who attend to deliveries: FY88–92: 70% of mothers who deliver in a health structure or at least X capsules/yr.
B. Promotion of vitamin A consumption through gardens:	
Initiate X demonstration vegetable gardens every year.	Organize village gardening committees and train them in CS/vitamin A and agricultural techniques: - FY88: X gardens - FY89: X gardens - FY90–92: X per year Initiate gardens according to the schedule of committees organized and trained above.

Indicators	Methods of Evaluation
No. and % of children receiving vitamin A two times during the year versus number and % of total at risk children	- Monthly and annual reports - Sample surveys
No. and % of capsules distributed versus no. and % capsules required by total children at risk	Monthly and annual reports Vitamin A capsule inventory reports
No. and % schoolchildren receiving vitamin A capsule two times/yr. versus no. and % of total at risk children	Monthly and annual reports Sample surveys
No. and % of capsules distributed versus no. and % capsules required by total children at risk	Monthly and annual reports Vitamin A capsule inventory reports
No. and % of mothers delivering and receiving vitamin A after delivery vs. no. & % of total at risk mothers	Maternity register reports Sample surveys
No. and % of capsules distributed through maternities versus no. and % capsules required by at risk mothers	Monthly reports - Vitamin A capsule inventory reports
No. of village gardening committees formed	- On site visits - Reports
No. of committees trained in CS vitamin A and agricultural techniques and percent who satisfactorily pass post test	Results of post test - On site visits Demonstration sessions of members trained
No. of gardens functioning during the planting season	On site visits Reports
Types and quantities of vegetables produced by the gardens	- On site visits Reports

Examples of PVO Project Objectives for Vitamin A Component (FY90-92) continued

Objectives	Activities and Benchmarks
In every village with a garden, train X people on vegetable gardening, drying, and recognition and prevention.	Prepare and implement training modules listed below by Sept. 1989: —Vegetable gardening —Vegetable drying —Recognition and prevention of vitamin A deficiency Provide refresher courses each year for 100 of those trained previously
C. Health education:	
Train X MOH staff in CS/vitamin A seminars or refresher courses.	Organize X training seminars and X refresher courses/yr. on CS/vitamin A themes: —No. trained per seminar —No. trained per refresher course
Train X village health educators, TBAs, or key village leaders on CS/vitamin A themes.	Organize X training seminars and X refresher courses/yr. on CS/vitamin A themes: —No. trained per seminar —No. trained per refresher course
Reach 60% of women of childbearing age with CS/vitamin A messages by Sept. 1992.	Broadcast on radio messages produced on national radio at least twice daily beginning March 1991 —FY90: Hold showings of film strips and slide series at least X times every quarter —FY90: Hold X showings per quarter for either film strips, video, or slide series.

Indicators	Methods of Evaluation
No. of modules prepared and implemented	Reports Modules produced
No. and percent of trainees who successfully pass post tests	Observations during feedback sessions Post test results
No. and percent of previously trained people who undergo refresher courses	Reports Refresher courses produced
No. and percent who pass post test	Post test results Observations during feedback sessions
No. of seminars and refresher courses organized	Reports observations
No. and percent satisfactorily passing post test	
As above	As above
Average no. of times radio messages used daily	Audience surveys Radio reports
No. of shows presented	Reports Sample surveys
No. of women attending	
As above	

ANNEX 5

TABLE 1 *Strategies and Resource Requirements to Prevent Vitamin A Deficiency States*

KEY

H High — H-a High (active)
M Medium — M-a Medium (active)
L Low — L-p Low (passive)
V Variable — N None — D Difficult — S Simple

Strategy	Population Coverage	Time to Achieve Benefits	Focus	Initial Cost	Continuing Cost	Public Participation	Personnel	Expertise	Initial Effort	Continued Effort	Ease of System Monitoring
Massive dosing	Individually targeted	Very short (days)	Single or multi nutrient limited	H	H	L-p	H	L	H	H	D
Nutrification	General population or targeted segment	Short (months)	Single (vitamin A) or multi nutrients	M	L	N	L	H	M	L	S
Macro horticultural approach	General population or targeted segment	Long (years)	Multi nutrients	H	M	H-a	H	H	H	M	M
Micro horticultural approach	General population or targeted segment	Medium (months-years)	Multi nutrients	M	L	H-a	M	M	H	M	D
Nutrition Education	General population or targeted segment	Long (years)	Multi nutrients	M	M	M-a	V	H	H	M	D
Public Health	General population or targeted segment	Medium (years)	Program dependent	V	V	V	V	H	V	V	D
Socio-economic Change	General population or targeted segment	Long (years)	Program dependent	V	V	M-a	V	H	V	V	M

International Vitamin A Consultative Group (IVACG)® *Guidelines for the Eradication of Vitamin A Deficiency and Xerophthalmia* (Washington D.C.: The Nutrition Foundation, Inc., 1977). Used with permission.

TABLE 2 ***Situations and Indicated Potential Interventions****

Situation Components of the Vitamin A Deficiency Problem						Interventions Range**		
(1)	(2)	(3)	(4)	(5)	(6)	Short	Intermediate or Long	
Yes	Yes	No	No	Yes	Yes	I, II	IIIb	IIIa, IV, VI
Yes	Yes	No	No	Yes	No	I, II	IIIb	IIIa, IV
Yes	Yes	No	No	No	Yes	IIIb, II	IV	IIIa, VI
Yes	Yes	No	No	No	No	IIIb, II	IV	IIIa
Yes	No	No	No	Yes	Yes	I, II	IV	VI
Yes	No	No	No	Yes	No	I, II	IV	IV
Yes	No	No	No	No	Yes	II	II	VI
Yes	No	No	No	No	No	II	IV	
No	Yes	Yes	No	Yes	Yes	I	IIIb, VI	IIIa, VI, V
No	Yes	Yes	No	Yes	No	I	IIIb, V	IIIa, IV
No	Yes	No	Yes	Yes	Yes	I	IV, IIIb	IIIa, VI
No	Yes	No	Yes	Yes	No	I	IV, IIIb	IIIa, IV
No	Yes	Yes	No	No	Yes	II	VI, V	IV, IIIa
No	Yes	Yes	No	No	No	IV	IV	V, IIIa
No	Yes	No	Yes	No	Yes	IV	IIIb	VI, IIIa
No	Yes	No	Yes	No	No	IV	IIIb	IIIa

*Explanation to codes for components of problem (Arabic numbers) and interventions (Roman numbers)

**Time also has a connotation of priority

Situation Components of the Vitamin A Deficiency Problem
Code to Table 2

1. Lack of natural food vitamin A sources.
2. Potential for increasing natural food vitamin A sources.
3. Improperly distributed and consumed by different sectors of population.
4. Improper intrafamilial distribution and consumption (especially affecting the small child).
5. Important incidence of severe clinical and biochemical signs.
6. Important secondary contributing factors (diarrhea, infections, poor overall diet).

Intervention Code for Interpretation of Table 2

I. Massive dosing
II. Nutrification
III. a. Macro horticulture
b. Micro horticulture
IV. Nutrition Education
V. Socio economic Approaches
VI. Public Health Approaches

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TABLE 3 — ***Prevention Schedule***

Children between 1 and 6 years of age or less than 110 cm in height (may be adjusted up to puberty)	— 200,000 IU vitamin A orally every 3 months
Infants less than 12 months	— 100,000 IU vitamin A orally every 3 months
Lactating women	— 200,000 IU vitamin A orally once during the first 2 months after delivery
Pregnant women	— No more than 10,000 IU per day during first half of pregnancy or, when necessary, 100,000 IU orally once during last trimester of pregnancy

TABLE 4 — ***Treatment Schedule***

Immediately on diagnosis	— 200,000 IU vitamin A orally*
Next day	— 200,000 IU vitamin A orally*
1–4 weeks later	— 200,000 IU vitamin A orally*

**Use half dose for infants less than 12 months of age.*

TABLE 5 — ***High-priority Risk Groups***

Children and adults with severe protein energy malnutrition	— Full treatment schedule* and continue in prevention program
Children with measles	— Single dose or full treatment schedule (see text)*
Children with diarrhea, lower respiratory tract disease, or other acute infections	— 200,000 IU vitamin A orally* once and continue in prevention program

**Use half dose for infants less than 12 months of age.*

International Vitamin A Consultative Group (IVACG).® *Guidelines for the Use of Vitamin A in Emergency and Relief Operations* (Washington, DC: The Nutrition Foundation, Inc., 1988). Used with permission.

Glossary of Acronyms

A.I.D.	Agency for International Development
ARI	Acute Respiratory Infection
CDD	Control of Diarrheal Diseases
CS	Child Survival
CSI	Child Survival I (projects receiving PVO Child Survival grant funding for the fiscal period 10/85-9/88)
EPI	Expanded Program on Immunization
FVA/PVC	Bureau for Food for Peace and Voluntary Assistance/Office of Private Voluntary Cooperation
HKI	Helen Keller International Vitamin A Technical Assistance Program (VITAP) 15 West 16th Street New York, NY 10011 USA Telex: 668152 Telephone: (212) 807-5853 FAX: (212) 463-9341
HQ	Headquarters
ISTI	International Science and Technology Institute
IVACG	International Vitamin A Consultative Group The Nutrition Foundation, Inc. 1126 Sixteenth St., N.W. Washington, D.C. 20036 USA Telex: 681-4107 NUFOUND Telephone: (202) 659-9024
MOH	Ministry of Health
PVO	Private Voluntary Organization
UNICEF	United Nations Children's Fund 3 UN Plaza New York, NY 10017
VITAP	Vitamin A Technical Assistance Program
WHO	World Health Organization WHO Publications Center USA 49 Sheridan Avenue Albany, NY 12210