

# Zambian National Strategy and Plan of Action for the Prevention and Control of Vitamin A Deficiency and Anemia

Developed by the National Food and Nutrition  
Commission

*with*

Key Partner Agencies and  
Technical Assistance from MOST/USAID



The USAID Micronutrient Program



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This five-year strategic plan to prevent and control vitamin A deficiency in Zambia serves as a model of a comprehensive, strategic plan for any country wishing to develop a micronutrient deficiency prevention and control program.

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## Acronyms

CBoH	Central Board of Health
CHW	Community Health Worker
DHMT	District Health Management Team
FHANIS	Food, Health and Nutrition Information System
HIV	Human Immuno-deficiency virus
IEC	Information, Education and Communication
IFA	Iron and Folic Acid
MoH	Ministry of Health
MOST	Micronutrient Opportunities, Strategies and Technologies
NFNC	National Food and Nutrition Commission
NIDs	National Immunization Days
PEM	Protein-Energy Malnutrition
sub-NIDs	sub-National Immunization Days
TBA	Traditional Birth Attendant
USAID	United States Agency for International Development
VAC	Vitamin A capsule
VA	Vitamin A
WHO	World Health Organization
ZIHP	Zambia Integrated Health Program

## Forward

**T**his five-year strategic plan to prevent and control vitamin A deficiency is the outcome of a four-day Strategic Planning Workshop convened by the National Food and Nutrition Commission in Zambia in April 1999. The plan is being disseminated now in part because there may be readers interested in the specifics of the strategies adopted by Zambia in the plan but, more importantly, as a model of a comprehensive, strategic plan for any country wishing to develop a micronutrient deficiency prevention and control program.

Attendees at the four-day Strategic Planning Workshop included approximately twenty-five participants representing a broad range of local and international agencies including UNICEF, Flying Doctors Service, Zambia Integrated Health Program, the Tropical Disease Research Center, Zambia Sugar, District Health Management Teams, University Teaching Hospital, the Ministry of Health, and the Ministry of Agriculture, Food and Fisheries. The workshop was divided into several sessions focusing on key interventions; vitamin A supplementation, iron and folic acid supplementation, fortification, dietary diversification and other public health measures including parasite and infection control. Groups were tasked with identifying current gaps in services, establishing feasible objectives for each intervention and identifying specific strategies needed to achieve those objectives. Detailed action plans were drafted for each of the interventions, and a set of next steps for immediate action was identified.

A working group consisting of three National Food and Nutrition Council staff members and a MOST consultant worked to refine the output of the strategic planning workshop. A working draft of the strategic plan was presented to a core group of partner agencies at the end of April 29, 1999 for reaction and comment. Their revisions were incorporated in the present document.

September 2004

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## Introduction

### Vitamin A Deficiency

Zambia has one of the highest infant and child mortality rates in Africa (107.5 and 192.3 per 1000 live births, respectively). These high rates are largely attributable to malaria, diarrhea, measles, malnutrition and acute lower respiratory tract infections, many of which are worsened by vitamin A deficiency. Results from a nationwide survey in 1997 (Luo et al., 1997) reported severe and widespread vitamin A deficiency in Zambia with 6% of children manifesting clinical deficiency (night blindness) and 65% with low or deficient serum retinol levels (Table 1). It is known from extensive community trials conducted in Africa and Asia that an average reduction of 23% in preschool-age mortality rates can be expected by improving the vitamin A status of preschool-age children in vitamin A deficient populations (Beaton et al., 1992). Thus, it is estimated that about 50,000 young Zambian children can be saved each year by accelerating and expanding vitamin A interventions to at least 80% of young children.

**Table 1. Selected Results of Zambian National Vitamin A Deficiency Survey, 1997 (Luo et al., 1997)**

	Children	Women
Night Blindness	6.2%	11.6%
Percent with deficient serum retinol levels (<10 ug/dl)	11.7%	2.0%
Percent with low or deficient serum retinol levels (<20 ug/dl)	65.7%	21.5%
Vitamin A capsule Coverage	28.4%	13.6%*

\* within 8 weeks after childbirth

Vitamin A deficiency is a nutritional disease with a primary nutritional solution: improve vitamin A nutriture to a physiologically acceptable level by removing the determinants of disease – chronic dietary insufficiency and/or absorption of vitamin A. This solution incorporates both notions of treatment for xerophthalmia, as well as prophylaxis, in populations where such malnutrition is manifested. Three interventions have been widely put forth: increasing the intake of vitamin A from the normal diet; fortification with vitamin A of a widely distributed food commodity; and periodic distribution of oral doses of vitamin A to vulnerable groups. Concurrent reduction in the magnitude and severity of precipitating or contributory risk factors, such as measles, moderate-to-severe protein-energy malnutrition (PEM), acute diarrhea, and respiratory infection through a variety of public health measures can serve to further reduce the morbid consequences of inadequate vitamin A nutrition in the community.

With respect to intervention progress in Zambia, vitamin A capsule supplementation coverage among risk groups has been erratic. High coverage rates have been achieved during large campaign-style strategies that extend beyond the traditional health system; however, these have been costly and are not likely to be sustainable. Coverage levels achieved during routine supplementation have ranged from 28%-53%, far below the desired level of 80% or more. Thus, there is a need to revitalize the vitamin A capsule distribution strategy, particularly in light of the phasing-out of national-scale National Immunization Days (NIDs). The revitalized approach may consist of designating two Vitamin A or Child Survival Weeks

six months apart (e.g. February and August) around which communications, logistics, monitoring and community mobilization can be streamlined. This approach should attempt to mobilize communities outside the health system by appealing to village chiefs, tapping church associations, using the primary school infrastructure and utilizing community volunteers. Ensuring a reliable and adequate supply of vitamin A capsules at the distribution points, however, is a critical aspect of making vitamin A capsule distribution campaigns work.

Vitamin A fortification of sugar has made major strides in Zambia and, provided the nutrient is stable under the normal conditions of processing, transport, storage, marketing and utilization, this intervention is likely to contribute to an improvement in the vitamin A status among risk groups regularly consuming sugar. For those risk groups that rarely consume sugar, other fortification vehicles such as maize meal should be explored.

There are little available data on the adequacy of intake of vitamin A from the normal Zambian diet among the at-risk population; although many regions in Zambia are thought to be food-insecure particularly during severe draught. Food consumption data indicate an overall decline in calories, fat and other nutrients over the past decade. Breastfeeding rates are also reportedly on the decline and, in the context of Zambia's HIV pandemic, may suffer further. There is a need to exert effort to increase the availability of vitamin-A containing foods in food-insecure areas while at the same time promoting increased consumption among children and mothers.

## **Anemia**

Iron deficiency anemia appears to be the most common micronutrient deficiency in Zambia today, affecting the lives of millions of

Zambian women, infants, school children and adolescents. It poses a major threat to safe motherhood, contributes to low birth weight, lowered resistance to infection, poor cognitive development and decreased work capacity.

Based on a 1998 national survey, anemia prevalence is widespread in Zambia particularly in young children (6-18 months) and pregnant women. The survey documented prevalence rates of 65% among children (of which 14.5% were severely anemic) and 46.9% among pregnant women (Table 2)

There appear to be multiple etiologies of anemia in Zambia, among which iron deficiency, malaria, hookworm and urinary schistosomiasis are likely to be the main causes. Therefore, integrated approaches based on the likely etiologies of anemia are recommended. The four basic approaches to the prevention of iron deficiency anemia are

- ▲ supplementation with medicinal iron,
- ▲ the control of infection,
- ▲ the fortification of a staple food with iron, and
- ▲ education and associated measures to increase dietary iron intake and absorption.

Supplementation with medicinal iron has the advantage of producing rapid improvement in iron status and can be targeted at population groups who most need iron or are at the greatest risk of being iron-deficient. While there are few data on iron supplementation coverage among pregnant women in Zambia, there are reports of an erratic supply of iron-folic acid (IFA) tablets, a major obstacle in many iron supplementation programs. In addition, poor compliance with treatment has also been cited as a problem, often due to side effects and ignorance about how to minimize them, as well as women's

**Table 2. Selected Results of Zambian National Anemia Survey, 1998 (Luo et. al., 1999)**

	<b>Children</b> 0-5 years N=1427	<b>Reproductive-Age Women</b> N=1498
Prevalence of Anemia	65.0%	46.9%* 39.1%**
Prevalence of Malaria	22.2%	8.6%
Prevalence of hookworm	4.3%	9.4%
Prevalence of urinary schistosomiasis	2.0%	9.4%

\* pregnant women; \*\* non-pregnant women

unawareness of their real need for iron during pregnancy. There is a need to ensure an adequate supply of IFA tablets for pregnant women in Zambia, and to raise the awareness of the need for iron supplements and coverage levels.

Hookworm (*Ancylostoma* and *Necator*) and schistosoma play a role in the etiology of anemia by causing chronic blood loss. In populations with endemic hookworm, anthelmintic therapy should be given presumptively to anyone with severe anemia, because treatment is safe and much less expensive than diagnosing hookworm infection.

*Plasmodium falciparum* malaria causes profound anemia during and after acute infection, although it is not clear whether malaria increases iron losses from the body. Nonetheless, given the high malaria rates in Zambia, malaria infection is likely to be an important cause of anemia.

In view of the multiple causes of anemia in Zambia, there is a need to strengthen integration points between parasite control and nutrition interventions while considering the extent to which they contribute to anemia.

## Strategy Formulation

To address the problems of vitamin A deficiency and anemia in risk groups, a National Vitamin A Deficiency and Anemia Control Strategic Planning Workshop was held on April 20-24, 1999 in Siavonga to

- a) review existing guidelines and strategies for vitamin A deficiency and anemia prevention and control programs;
- b) identify and prioritize problems and solutions associated with these programs;
- c) establish operational objectives, identify indicators for the achievement of those objectives, and write explicit strategy statements for each of the key interventions;<sup>1</sup>
- d) develop a five-year operational Plan of Action linked to the micronutrient component of the food and nutrition program of the Government of the Republic of Zambia identifying key activities, expected outputs, timeframes, inputs (technical, supplies, and funds), potential sources of inputs and institutional responsibilities; and
- e) draft a monitoring and evaluation framework linked to the operational plan of action as well as a management mechanism for coordinating collaborating partners.

Based on the decisions and recommendations made at the strategic planning workshop, a core group of staff from the National Food and Nutrition Commission (NFNC) reviewed and refined the objectives and strategies for each major intervention area and developed a list of critical activities and steps needed to achieve the intervention objectives. The list was reviewed and presented to several members of the NFNC Board as well as a small group of technical experts for comment and endorsement.

## The Strategy

The key strategies are:

- ▲ **Vitamin A Supplementation** for children < 6 years of age and for post-partum women immediately after childbirth;
- ▲ **Fortification of sugar** with vitamin A;
- ▲ **Exploration of fortification of maize meal** with a micronutrient mix;
- ▲ **IFA Supplementation** for pregnant women, as well as screening and treatment for severe anemia and its related causes, i.e. parasitic infection (iron supplementation of infants between 6-24 months will be considered if sufficient resources can be generated);

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<sup>1</sup> The key interventions include Vitamin A supplementation for children and post-partum women, IFA supplementation, Fortification with vitamin A and Iron, Dietary diversification, and other public health measures especially, parasite and infection control

- ▲ **Parasite Control** for individuals with severe anemia in malaria, hookworm, and urinary schistosomiasis endemic areas (presumptive anti-helminth treatment should be considered in areas where hookworm is endemic);
- ▲ **Dietary Diversification**, including crop diversification and livestock promotion, in food-insecure areas as well as the promotion of key dietary behaviors known to improve vitamin A and iron intake and absorption (such as breastfeeding, adequate complementary feeding).

Program components to support the successful implementation of the strategies are also highlighted and are listed below.

- ▲ **Policy Guidelines** – written policies for each intervention specifying the rationale for the intervention, target groups, and the specific protocols for each intervention component (e.g. target group, form of supplement, dose to be given, frequency of doses)
- ▲ **Logistics** – procurement guidelines, inclusion of supplements on Zambia’s essential drug list and essential drug kit, system and finances to procure needed supplements (or other intervention inputs), transport, distribution and storage system for getting supplements out to clinics and communities, and a mechanism to reach a high proportion of the at-risk groups with vital micronutrient services (i.e. supplements, fortified foods, educational messages, etc.).

- ▲ **Training** – competencies identified, training modules available and up-to-date, training programs identified into which micronutrient training modules can be integrated, etc.
- ▲ **Information, Education and Communication (IEC)** – communications strategy developed identifying target audience, key behaviors to promote, messages that encourage adoption of behavior, effective communication channel, needed materials, etc.
- ▲ **Monitoring and evaluation** – monitoring and evaluation plan that identifies specific intervention objectives, indicators to measure those objectives, criteria and targets, monitoring or evaluation design, and the types and sources of data
- ▲ **Operations Research** – identification of priority research gaps and institutions which can help, technically and/or financially, conduct and/or support the needed research.

## Main Interventions

### Specific Objectives and Strategies

#### Vitamin A Supplementation

##### Objectives

- ▲ Give appropriate dose of vitamin A capsules to at least 80% of children between the ages of 0-72 months every six months.
- ▲ Give vitamin A capsules to at least 80% of post-partum mothers within six weeks of delivery, irrespective of whether they are breastfeeding.
- ▲ Give vitamin A capsules to all children who come to the health facility (health post, center, clinic or hospital) with signs and symptoms of prolonged diarrhea (more than three days), measles, severe protein-energy malnutrition – provided they have not received a vitamin A supplement within one month.
- ▲ Screen all sick and severely malnourished children for xerophthalmia (especially night blindness) and treat with World Health Organization (WHO) recommended treatment protocol.

##### Strategies

- ▲ Conduct and regularize National Child Survival Weeks two times per year (e.g. last week of February and last week of August) for at least the next five years. As long as sub-National Immunization Days (sub-NIDs) continue in Zambia, vitamin A capsule distribution will be ‘piggy-backed’ on this activity in the areas where NIDs are operating. In non-NIDs areas and during the February National Child Survival Weeks, all children between the ages of 1-6 years will be given a 200,000 IU vitamin A capsule. The purpose of assigning two specific weeks during the year for universal vitamin A distribution is to streamline logistics, communications, and social mobilization. During the National Vitamin A/Child Survival Weeks, health workers and volunteers (including Community-Based Distributors, Traditional Birth Attendants (TBAs), Community Health Workers (CHWs), and Neighborhood Health Committees), schools, and church services will be mobilized to distribute vitamin A to the target group. Receipt of vitamin A capsule during National Vitamin A/Child Survival Week should be recorded on the Under-Five Children’s Clinic Card.
- ▲ Strengthen integration of vitamin A capsule supplementation in Universal Child Immunization program for children under one year of age. The breastfeeding status of infants should be assessed during immunization contacts and a one-time dose of 50,000 IU of vitamin A should be given and recorded on Under-Five Child Card for those who are not breastfed and are under 6 months of age. Infants between 6-11 months of age should be given 100,000 IU vitamin A along with their measles vaccination.
- ▲ Incorporate vitamin A capsules into the country’s Essential Drug list, the Essential Drug kit for health centers.

- ▲ Develop a policy on capsule procurement that will simplify administration of vitamin A capsules by adopting standard preparations:
  - for infants 0-5 months  
50,000 IU (white opaque capsules)
  - for 6-11 months:  
100,000 IU (blue opaque capsules)
  - for children 1-6 yrs:  
200,000 IU (red opaque capsules)
- ▲ Ensure that vitamin A capsule administration is part of the treatment protocol for measles, prolonged diarrhea and severe PEM in hospitals, clinics and health centers. Raise the awareness of vitamin A capsule administration as part of the treatment protocols through a targeted communications strategy.
- ▲ Integrate detection and treatment of night blindness into sick-child initiatives (i.e. Integrated Management of Childhood Illness).
- ▲ Include postpartum vitamin A supplementation (200,000 IU) in the protocol of CHWs and TBAs at the time of delivery.
- ▲ Vitamin A supplementation during the Expanded Program on Immunizations, antenatal visits, routine supplementation and National Vitamin A/Child Survival Weeks should be recorded on the appropriate cards and registers (i.e. Antenatal clinic card for post-partum supplementation and the Under-Five Children's Clinic Card). The current cards should be revised to easily record vitamin A capsule supplement receipt.

## Sugar Fortification

### Objectives

- ▲ Ensure that all sugar for domestic household consumption on the Zambian market is fortified with required level of vitamin A.

- ▲ Improve awareness that sugar in packets bearing the certified Vitamin A logo is fortified with vitamin A.

### Strategies

- ▲ Promote awareness of Strategy Instrument stipulations among regulatory agencies (i.e. Health Inspectorate, Zambia Revenue Authority, Zambia Bureau of Standards) through dissemination of the Strategy Instrument and consultative meetings.
- ▲ Offer technical support to domestic sugar producers to fortify their sugar with vitamin A.
- ▲ Conduct operational research (i.e. shelf-life study) to establish the vitamin A retention levels during normal conditions of transport, storage, repackaging and marketing. Based on findings of the research, recommend ways to improve vitamin A retention.

## Maize-Meal Fortification

### Objectives

- ▲ 75% of large-scale maize millers will fortify maize meal with multiple nutrients at the levels stipulated by the Food and Drug Control Board of Zambia.

### Strategies

- ▲ Develop and test a standard technical norm to be prepared for the fortification of maize meal to be used as a reference for those industries willing to increase the added value of their products.
- ▲ Conduct research on bio-availability and stability of the multi-nutrient mix added to maize meal.
- ▲ Conduct a pilot trial to determine the appropriate equipment and processing conditions for maize-meal fortification.

- ▲ Conduct an efficacy trial to assess the impact of maize-meal fortification on the micronutrient status of the risk groups.
- ▲ Raise awareness and capacity of large maize-meal millers and policy makers about the potential commercial and public health benefits of fortification.
- ▲ Design a catchy logo to be used on all packages/containers used to sell fortified maize meal.
- ▲ Advocate for funds from the Central Board of Health (CBoH) and District Health Management Team (DHMT) to provide and allocate resources for procuring adequate supplies of IFA tablets.
- ▲ Pilot the use of TBAs as distributors of IFA to pregnant women in Zambia Integrated Health Program (ZIHP) districts.

## IFA Supplementation

### Objectives

- ▲ Provide daily IFA tablets (200 mg ferrous sulfate and 400 ug folic acid) to 80% of pregnant women, irrespective of hemoglobin levels, to commence as early as possible during pregnancy, and be continued throughout pregnancy and three months into the postpartum period.
- ▲ Screen all pregnant women attending antenatal clinics for severe anemia using the most appropriate and feasible screening method at the health care level, and provide treatment or refer women for appropriate treatment of severe anemia.
- ▲ Explore delivery mechanisms and resource generation for iron supplementation among 6-18 month old children.
- ▲ Strengthen counseling skills of CHWs, TBAs, and health staff to counsel pregnant women on the need and benefit of IFA supplementation, on possible side effects from oral iron (such as nausea, abdominal discomfort and constipation), and on how to minimize discomfort. Changes in the color of the stool due to oral iron can cause anxiety and should also be explained prior to administration.
- ▲ Develop counseling cards to assist CHWs, TBAs and health staff to inform mothers of possible side-effects and ways to minimize them. Integrate the cards into existing or new IEC materials for the service deliverers.
- ▲ Screen all pregnant women attending antenatal clinics for severe anemia using the most feasible and appropriate method in the given primary health care setting (i.e. either hemoglobin or hematocrit determination, the Talqvist method using the WHO hemoglobin Color scale, or assessment of pallor in the inferior conjunctiva of the eye, the nail beds and the palm). Pregnant women in their last month of pregnancy (i.e. beyond 36 weeks of gestation), determined to have severe anemia or who present with signs of respiratory distress or cardiac abnormalities (i.e. labored breathing at rest or edema), should be referred to a hospital for treatment. Others can be treated in the local primary health care

### Strategies

- ▲ Assess IFA supply at the antenatal clinics, IFA coverage among pregnant women, proportion attending antenatal clinics within the first or second trimester of pregnancy, and the proportion of pregnant women given an adequate supply of IFA capsules for pregnancy and through three months post-partum.
- ▲ Ensure that IFA tablets are included in the Essential Drug Kits.

setting by giving 120-mg iron and 400-ug folic acid daily for three months, after which they should continue receiving preventive supplementation.

## Parasite Prevention and Control

### Objectives

*For individuals with severe anemia:*

- ▲ Where hookworm is endemic, and in areas identified as endemic for intestinal parasites, provide a single dose of 500-mg mebendazole at the earliest antenatal visit after the first trimester.
- ▲ Where urinary schistosomiasis is endemic, if the affected person is over 5 years old, check for visual hematuria. If present, give a single dose of Praziquantel at 40 mg/kg.
- ▲ In malarious areas, routinely screen and treat all pregnant women with fever for malaria at the first prenatal visit, followed by anti-malarial prophylaxis according to local recommendations.

### Strategy

- ▲ Integration points will be identified and strengthened.

## Dietary Diversification

*Dietary Modification*

### Objectives

- ▲ Increase the consumption of vitamin A-containing foods among children from 6-11 months and 1-5 years of age, as well as pregnant and lactating women.
- ▲ Increase the proportion of non-HIV-infected mothers who initiate breastfeeding at birth, exclusively or fully breastfeed their infants from birth

to 6 months of age, and who continue breastfeeding (along with providing adequate complementary foods) their children up to 18-24 months of age.

### Strategies

- ▲ Identify commonly available vitamin A-containing foods by main seasons in food-secure and food-insecure areas.
- ▲ Develop a communications plan to promote the increased consumption of commonly available vitamin A-containing foods among the groups most at-risk (children 6-11 month and 1-5 year of age, as well as pregnant and lactating women). The plan should be based on a careful assessment of the following questions: Who needs to modify the diet?; Who has the power to change the behavior?; What dietary modification is most feasible and will have the most impact?; Why would the target audience want to change their behavior or what motivations can be offered for changing it?; What is preventing the target audience from changing their behavior? What are the obstacles to behavior change? Answers to some of these questions, if not already known, may be explored in the proposed baseline studies being considered by ZIHP.
- ▲ Pilot the implementation of the plan in areas where availability of vitamin A-containing foods will not substantially limit the adoption of the recommended dietary behaviors.

*Food Production*

### Objectives

- ▲ Improve the availability of carotene-rich foods at the family level, given the agro-ecological conditions in the area.
- ▲ Improve the availability of small livestock

(esp. egg-producing chickens) at the household level.

- ▲ Improve the consumption, particularly by pregnant and lactating women and preschool children, of carotene- and retinol-rich foods produced by the family.

### **Strategies**

- ▲ Identify areas/districts where the availability of carotene-rich foods at the family level is a limiting factor to increased consumption and where the conditions for improving household availability of these foods is reasonably high (i.e. existing water source, existing land, etc.).

- ▲ Coordinate with the Ministry of Agriculture, Food and Fisheries to intensify the promotion of household food production (home gardens, school gardens, small livestock production) in these areas.
- ▲ Design and implement a communications strategy that promotes household consumption of home-produced foods, particularly among the most at-risk groups.

## Communications

There is a strong need for a communications component to assist with the strategy implementation. Each intervention may have some specific messages that require communication to service providers and specific target audiences. However, there is a need to assess communications issues that cross-cut the various micronutrients and to develop a coherent communications strategy targeting policy makers, DHMTs and other health service providers, and the target groups. Opportunities to piggy-back questions on existing or planned surveys, such as the ZIHP baseline survey, the Food, Health and Nutrition Information System (FHANIS) “End of Decade” survey, and others should be maximized to fill information gaps regarding the target audiences’ perceptions on micronutrient supplements (especially iron) and perceptions of health practices or behaviors being proposed in the Action Plan.

## Monitoring and Evaluation

Monitoring involves assessing the adequacy of implementation and is important to improving the strategies identified under each intervention. There is a need to establish a monitoring system that will assess the adequacy with which the various interventions identified in this Plan have been implemented. Such a system will need to track the following:

- ▲ Inputs (materials, personnel and resources)
- ▲ Activities (adherence to established Action Plans)
- ▲ Outputs (coverage achieved by the interventions)
- ▲ Training and supervision (type and number of DHMTs and others trained, adequacy of training, adequacy of supervision)

The specific action plans developed for each of the major interventions list major activities, expected outputs, locus of responsibility, inputs needed (technical, supplies and resources), and potential sources of inputs. These Action Plans can serve as a template from which specific monitoring tools can be developed. Moreover, there is a need to determine the type and quality of existing information systems and data collection processes already in order to maximize their utilization. In this regard, FHANIS, the FHANIS 1999 “End of Decade” survey, and the Health Management Information System, and other data collection systems should be carefully examined to determine whether they are already collecting needed monitoring data or whether they can be requested to collect this information.

Measuring the attainment of the objectives identified under each intervention requires an appropriate evaluation design. A matrix specific to each of the intervention objectives is provided in the Appendix as an evaluation framework; however, it needs to be more carefully translated into appropriate evaluation designs.

It is highly recommended that a mechanism to obtain reasonable estimates of vitamin A coverage among preschool-age children be established after each vitamin A capsule distribution period. It may be possible to tap the FHANIS infrastructure to undertake this task, or design a cluster-survey that utilizes district-level personnel to collect data within a month of the Vitamin A or Child Survival Weeks. With an appropriate sample design and standardized methods for obtaining information on vitamin A capsule receipt, it may be possible to obtain reasonable vitamin A capsule coverage estimates at a national level.

## Organization and Management

**N**FNC, in connection with a Steering Committee, will coordinate the overall implementation of the National Vitamin A Deficiency and Anemia Prevention and Control Plan. Functions and suggested composition of the Steering Committee are included in the Appendix. NFNC will form or reactivate key working groups/task forces, consisting of an NFNC representative and three or four other members, to be chaired by appropriate individuals from strategic partner agencies. In the initial phase of plan implementation the following working groups/task forces have been identified as being critical to plan implementation:

- ▲ Vitamin A or Child Survival Week Task Force
- ▲ Micronutrient Communications Task Force
- ▲ Fortification Task Force
- ▲ Monitoring and Evaluation Task Force
- ▲ Micronutrient Technical Task Force

Suggested tasks and compositions for the first two working groups listed above are provided in the Appendix.

## Key Activities for Main Interventions

### Vitamin A Supplementation

*Formalize revisions to the vitamin A capsule supplementation policy (dose, target populations, capsule forms/colors, vitamin A capsules to be included in essential drug kit).*

- ▲ Update existing VA supplementation policy for both prevention and treatment.
- ▲ Present revised VA supplement policy to Micronutrient Technical Task Force for endorsement.
- ▲ Present policy to CBoH/Ministry of Health (MoH) for endorsement.
- ▲ Produce and distribute a policy guideline for districts and health workers.

*Develop and conduct training program to support VA supplementation strategies.*

- ▲ Design and conduct training-of-trainers for DHMTs on the implementation of the new policy guidelines and the supplementation strategies.
- ▲ Include post-partum VA dosing into training program for CHWs and TBAs, and ensure that TBA kits include a supply of vitamin A as well as visual guidelines on post-partum vitamin A capsule supplementation.

*Develop a system of regular vitamin A capsule procurement, storage and distribution to DHMTs and to health clinics and posts.*

- ▲ Advocate to include vitamin A capsules in essential drug kit.
- ▲ Designate a person at NFNC to follow up and coordinate vitamin A capsule procurement with donor agencies (i.e. UNICEF), prepare distribution list specifying vitamin A capsule quantities per district, repackaging vitamin A capsule supply on a per district basis, communicating availability of vitamin A capsules to the district, determining whether the district obtained a vitamin A capsule supply in time for National Vitamin A (VA) Weeks.

*Promote VA Week among the DHMTs, health clinics, communities, and target groups.*

- ▲ Establish VA Week Task Force charged with overseeing the implementation of the VA Week. The task force will be expected to:
  - ▲ Develop a VA Week implementation plan.
  - ▲ Mobilize resources to promote VA Week.
  - ▲ Oversee procurement and distribution of vitamin A capsules to the DHMTs.
  - ▲ Coordinate VA Week messages with those of the sub-NIDs and other related communication programs.

- ▲ Monitor VA Week implementation.
- ▲ Prepare VA Week report.
- ▲ Release VA Week coverage results to the media and policy makers and DHMTs.

*Complete the revision of the Under-Five Children's Clinic Card*

- ▲ Pretest and finalize the revised Under-Five Children's Clinic Card.
- ▲ Produce and distribute cards in adequate quantity for distribution to DHMTs.
- ▲ Orient DHMTs on revisions made on card, particularly the section where vitamin A capsule supplementation and immunization should be recorded.

*Pilot alternative strategies for sustainable social mobilization during VA/Child Survival Week in selected ZIHP districts (e.g. using village chiefs, churches, Community-Based Distributors, schools, preschools and neighborhood health committees).*

- ▲ Develop a pilot test protocol in consultation with ZIHP.
- ▲ Hold consultations with relevant school, MOE, church and community group authorities.
- ▲ Develop simple modules to help DHMTs orient school teachers and community volunteers on the implementation of VA Week.
- ▲ Develop simple tools for community workers and teachers on giving the vitamin A capsules to the right target groups, recording vitamin A capsule receipt on the under five Children's Card, and reporting vitamin A capsule coverage to the DHMT.
- ▲ Evaluate the pilot intervention to determine if the change in vitamin A capsule coverage justifies the added resources and effort needed to mobilize community groups.

*Identify and test key behavior-oriented vitamin A messages to be incorporated into a micronutrient communications plan as well as inserted in other health communication programs.*

- ▲ Designate an NFNC technical staff member to participate on the Micronutrient Communications Task Force as well as to serve as a liaison between NFNC and other health communications programs such as ZIHP, NIDs, and the MoH Health Communications Unit.
- ▲ Develop a list of key behavior-oriented vitamin A messages that can be incorporated into existing or new communications materials.
- ▲ Pilot and evaluate the interventions in ZIHP areas.

## Sugar Fortification

*Advocate for the enforcement of the Statutory Instrument for fortified sugar.*

- ▲ Hold consultative meetings with regulatory agencies (Health Inspectorate, Zambia Revenue Authority, Zambia Bureau of Standards) to disseminate the Statutory Instrument on fortified sugar.

*Conduct a study to assess the stability of vitamin A in fortified sugar under normal conditions of transport, storage, and point-of-purchase.*

- ▲ Review and revise existing protocol submitted by FTRU/NCSR.
- ▲ Contract NCSR to conduct the study.
- ▲ Convene a technical group to review the findings and make recommendations on ways to preserve the stability of VA during storage, transport and marketing.
- ▲ Disseminate the findings to the end-

users.

*Train the technical staff of the sugar industry and the FDCL on quality control and quality assurance at the factory level paying particular attention to the use of lot-quality assurance sampling and spectrophotometric analysis.*

- ▲ Identify appropriate technical staff to be trained.
- ▲ Ensure that reagents and equipment for quality assurance and quality control are available at each facility (i.e. sugar plant and FDCL).
- ▲ Arrange for a technical consultant to train technicians in quality assurance and quality control.

*Implement Quality Assurance and Quality Control procedures.*

- ▲ Implement procedures at the sugar plant.
- ▲ FDCL should conduct regular site visits to the sugar plant to ensure that quality control and quality assurance procedures are being implemented.

## **Maize-Meal Fortification**

*Finalize the regulations for maize-meal fortification*

- ▲ Conduct consultative meeting among maize-meal millers to finalize the regulations for maize meal fortification.
- ▲ Regulations will be sent to Legal Affairs for gazetting, review, and inclusion in the printing of Food and Drug regulations.
- ▲ Disseminate the Food and Drug regulations to the maize-meal millers, Food and Drug Control Lab, and the Bureau of Standards.

*Conduct research on bio-availability and stability of the multi-nutrient mix added to maize meal.*

- ▲ Assess bio-availability of various iron salts in maize meal.
- ▲ Test the stability of the multi-nutrient mix under normal conditions of processing, transport and storage.

*Establish the most appropriate equipment and processing conditions for maize meal fortification.*

- ▲ Obtain information on equipment used in countries currently fortifying maize meal.
- ▲ Conduct a pilot at varying milling sites to determine the most appropriate way to add the micronutrient mix to the maize meal.

*Establish the efficacy of maize meal fortification.*

- ▲ Conduct a trial to establish the efficacy of maize-meal fortification on the micronutrient status of relevant risk groups.

*Raise the awareness among policy makers and large millers and increase the capacity of large mills to enable maize meal fortification.*

- ▲ Conduct sensitization workshop with millers and policy makers.

## **IFA Supplementation**

*Update and distribute iron supplementation guidelines.*

- ▲ Review existing MoH guidelines on iron supplementation and determine if they conform with current WHO recommendations. Update the guidelines, if necessary, and have them endorsed by MoH for distribution and implementation by DHMTs and Hospital Management Boards.

*Develop a program to improve iron supplementation coverage and compliance among pregnant women.*

- ▲ Review the existing counseling skills and practices of health workers, CHWs, TBAs, and others involved in distribution of IFA supplements to pregnant women to identify knowledge and skill areas which need strengthening. This will be done by carrying out a rapid Knowledge, Attitude and Practice survey among health workers, CHW, TBAs, and others.

*Develop and conduct a training program to support IFA supplementation to pregnant women.*

- ▲ Design and conduct training-of-trainers for DHMTs on the implementation of the appropriate approaches for IFA supplementation to pregnant women. Efforts should be made to coordinate and integrate this training-of-trainers with the training-of-trainers on the revised Vitamin A supplementation guidelines.
- ▲ Design, test and produce counseling cards and other communication materials for health and community workers to use in motivating pregnant women to take IFA tablets early in pregnancy continuing until delivery, and up to three months post-partum.

*At CBoH/MoH/Church Missions Association of Zambia, advocate for screening, at all levels of the primary health care system, for severe anemia during pregnancy, using the most feasible and appropriate methods.*

- ▲ Conduct assessment of existing screening techniques and equipment used to detect severe anemia in pregnancy, make appropriate recommendation to relevant authorities, as above.

*Develop indicators for monitoring and evaluation of IFA supplementation.*

- ▲ Participate in the formulation of a national micronutrient monitoring and evaluation system.

*Reactivate Iron Deficiency Anemia Task Forces to provide technical guidance on the implementation of an IFA supplementation program.*

- ▲ Hold quarterly review meetings
- ▲ Liaise with CBoH to provide adequate funds and allocation of resources to procure sufficient supplies of IFA tablets.

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# Appendix 1: Proposed Tasks of Selected Task Forces

## Child Survival/Vitamin A Week Task Force

### Tasks

#### *Technical*

Make technical decisions regarding target group (e.g. 1-6 year olds or 1-5 year olds), dose, form of supplement to be used (vitamin A capsule with nipple), distribution points (e.g. clinic only vs. clinic and village distribution posts), eligible distributors (e.g. health clinic staff, volunteers, etc.), and weeks during which distribution will take place (e.g. last week of February and last week of August).

#### *Logistical decisions and oversight*

Develop a logistic plan; plan the number of vitamin A capsules needed and time required; mobilize resources from MoH, CBoH and donors for vitamin A capsule supply and support for other logistical needs; coordinate with donors on time of delivery of vitamin A capsule supply; communicate with DHMTs when vitamin A capsule supply has arrived in order to arrange for pick-up; identify ways to get vitamin A capsule supply to remote DHMTs who are not able to collect the vitamin A capsules.

#### *Communications*

Identify key behavioral messages to be disseminated before VA/Child Survival Week. Coordinate message development and creative execution of messages with the Micronutrient Communications Task Force.

#### *Training*

- ▲ Identify technical information and skills needed by health providers and volunteers (e.g. dose, eligible target group), how to administer vitamin A capsules, how to record vitamin A capsule receipt, how to avoid overdosing, how to estimate proportion of children in location who received vitamin A capsules, etc.)
- ▲ Draft modules or simple guides to aid health workers and volunteers to utilize technical skills.
- ▲ Oversee conduct of training-of-trainers at the DHMTs, if needed.

### *Launch*

Organize the Launch of VA/Child Survival Weeks at a national and perhaps provincial level by tapping chiefs, politicians, media and health workers.

### *Monitor vitamin A capsule coverage*

- ▲ Establish ‘quick count’ mechanisms via radio communications with DHMTs.
- ▲ Oversee the design and implementation of a cluster survey to assess vitamin A capsule coverage (and other selected information) to be conducted within two months of the VA/Child Survival Week. See Monitoring and Evaluation section for further information on this.

### *Composition*

University Teaching Hospital representative  
NFNC representative  
ZIHP representative  
DHMT representative  
MoH representative  
UNICEF representative

# Micronutrient Communications Task Force

## Tasks

Develop communications strategies to support the following:

- ▲ VA/Child Survival Weeks
- ▲ Promotion of Statutory Instrument
- ▲ Recognition of vitamin A logo on fortified sugar
- ▲ Specific communications needs identified under each main intervention

## Composition

ZIHP representative

NFNC representative

MoH representative

UNICEF/NIDs representative

## Appendix 2: Monitoring and Evaluation Framework

Intervention	Objective	Indicators	Criteria & targets	Design	Types & Sources of data
Vitamin A Supplementation	Give appropriate dose of vitamin A capsule to at least 80% of children between the ages of 0-72 months every six months.	<ul style="list-style-type: none"> <li>• Proportion of children who received vitamin A capsule within previous six months (&lt;1 yr, 1-6 yr)</li> <li>• Proportion of children who received at least two VAC within previous year</li> <li>• Proportion of children who have VAC receipt recorded on Under-Five Card</li> </ul>	<ul style="list-style-type: none"> <li>• &gt;80% VAC coverage after each National VA/Child Survival Week</li> <li>• VAC recorded on Under-Five card for all children receiving VAC</li> </ul>	<ul style="list-style-type: none"> <li>• Before-after comparison (may be obtained from cluster survey following VA/Child Survival Week)</li> </ul>	<ul style="list-style-type: none"> <li>• Cluster survey; explore whether FHANIS or other existing data collection system can be used</li> </ul>
	Give vitamin A capsule to at least 80% of post-partum mothers within 6 weeks of delivery, irrespective of whether they are breastfeeding.	<ul style="list-style-type: none"> <li>• Proportion of women who gave birth in past year who received VAC within six weeks after childbirth</li> </ul>	<ul style="list-style-type: none"> <li>• &gt;80% VAC coverage among post-partum women</li> </ul>	<ul style="list-style-type: none"> <li>• Before-after comparison (may be obtained from cluster survey following VA/Child Survival Week)</li> </ul>	<ul style="list-style-type: none"> <li>• Cluster survey; explore whether FHANIS or other existing data collection system can be used</li> </ul>
	Give VAC to all children who come to the health facility (health post, center, clinic or hospital) with signs and symptoms of prolonged diarrhea (more than three days), measles, severe protein-energy malnutrition – provided they have not received a vitamin A supplement within one month.	<ul style="list-style-type: none"> <li>• Proportion of children who presented at health clinic/health post within the past three months with prolonged diarrhea (more than three days), measles, or severe PEM that received VAC during clinic visit</li> </ul>	<ul style="list-style-type: none"> <li>• &gt;80% VAC coverage among children presenting with disease conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Before-after comparison (may be obtained from cluster survey following VA/Child Survival Week)</li> </ul>	<ul style="list-style-type: none"> <li>• Cluster survey; explore whether FHANIS or other existing data collection system can be used</li> <li>• Review of clinic records and countercheck clinic records with Under-Five Card or interview of child</li> </ul>
	Screen all sick and severely malnourished children for xerophthalmia (especially night blindness)	<ul style="list-style-type: none"> <li>• Proportion of caregivers who brought sick children to health clinic who were asked if the child had a history of night blindness</li> </ul>	<ul style="list-style-type: none"> <li>• &gt;80% asked about night blindness history</li> </ul>	<ul style="list-style-type: none"> <li>• Post-clinic visit interviews</li> <li>• Before-after comparison (may be obtained from cluster survey following VA/Child Survival Week)</li> </ul>	

Intervention	Objective	Indicators	Criteria & targets	Design	Types & Sources of data
Sugar Fortification	Ensure that all sugar for domestic household consumption on the Zambian market is fortified with required level of vitamin A.	<ul style="list-style-type: none"> <li>Proportion of sugar sampled from domestic factories and points-of-purchase containing required amounts of vitamin A</li> </ul>	<ul style="list-style-type: none"> <li>All Zambian sugar sold in markets contains VA</li> </ul>		<ul style="list-style-type: none"> <li>Sugar samples collected periodically from markets and analyzed for VA content</li> </ul>
	Improve awareness that sugar packets bearing the certified Vitamin A logo is fortified vitamin A.	<ul style="list-style-type: none"> <li>Proportion of consumers who purchase vitamin A who recognize and understand meaning of vitamin A logo.</li> </ul>	<ul style="list-style-type: none"> <li>&gt;50% of consumers are aware of vitamin A logo</li> </ul>	<ul style="list-style-type: none"> <li>Before-after comparison (may be obtained from cluster survey following VA/Child Survival Week)</li> </ul>	
IFA supplementation	Provide daily IFA tablets (200 mg ferrous sulfate and 400 ug folic acid) to 80% of pregnant women, irrespective of hemoglobin levels, to commence as early as possible during pregnancy, continued throughout pregnancy and three months into the postpartum period.	<ul style="list-style-type: none"> <li>Proportion of pregnant women who received adequate number of IFA tablets</li> <li>Proportion of pregnant women attending antenatal clinics receiving adequate number of IFA tablets</li> <li>Proportion of pregnant women taking iron tablets in current pregnancy</li> <li>Proportion of women counseled on benefits of taking iron, advised on possible side-effects and advised on how to minimize them</li> </ul>	<ul style="list-style-type: none"> <li>&gt;80% of pregnant women taking iron during current pregnancy &gt;90% of women attending antenatal clinic who received adequate iron tablet supply and given adequate counseling</li> </ul>	<ul style="list-style-type: none"> <li>Before-after comparison from cluster survey following VA/Child Survival Week</li> </ul>	<ul style="list-style-type: none"> <li>Cluster survey; explore whether FHANIS or other existing data collection system can be used Obtain baseline during "End of Decade" survey conducted by FHANIS in 1999</li> </ul>

<b>Intervention</b>	<b>Objective</b>	<b>Indicators</b>	<b>Criteria &amp; targets</b>	<b>Design</b>	<b>Types &amp; Sources of data</b>
Dietary Modification	Increase the consumption of vitamin A-containing foods among children 6-11 months of age, 1-6 years, pregnant and lactating mothers.	<ul style="list-style-type: none"> <li>• Frequency of consumption per week of vitamin A-containing foods by specific groups (children from 6-11 months, 1-3 years, and 4-6 years of age as well as pregnant and lactating women)</li> </ul>	<ul style="list-style-type: none"> <li>• Consumption of carotene-rich foods at least three times per week, when available, by 80% of the target groups</li> </ul>		<ul style="list-style-type: none"> <li>• Explore whether baseline data may be obtained from agricultural services; if not, a special survey is necessary</li> </ul>
	Increase the proportion of (non-HIV-infected) mothers who initiate breastfeeding at birth, exclusively or fully breastfeed their infants from birth to 6 months of age, and who continue breastfeeding (along with providing adequate complementary foods) their children up to 18-24 months old.	<ul style="list-style-type: none"> <li>• Proportion of mothers (non-HIV infected) who exclusively or fully breastfed infants from birth to 6 months of age</li> <li>• Proportion of mothers who started introducing VA-containing foods to children 6-11 months</li> <li>• Proportion of mothers who still breastfeed children from 6-11 month, 12-17 months, and 18-23 months</li> </ul>		<ul style="list-style-type: none"> <li>• Before-after comparison</li> </ul>	

<b>Intervention</b>	<b>Objective</b>	<b>Indicators</b>	<b>Criteria &amp; targets</b>	<b>Design</b>	<b>Types &amp; Sources of data</b>
Food Production	Improve the availability of carotene-rich foods at the family level, taking into account the agro-ecological conditions in the area.	<ul style="list-style-type: none"> <li>• Proportion of households with gardens</li> <li>• Proportion of households with gardens producing VA rich foods</li> <li>• No. of months VA rich foods grown in garden</li> </ul>	<ul style="list-style-type: none"> <li>• Production of carotene-rich foods for at least 6 months of the year in semi-arid areas, and throughout the year if there are not constraints, by 95% of home gardens</li> </ul>	<ul style="list-style-type: none"> <li>• Before-after comparison</li> </ul>	<ul style="list-style-type: none"> <li>• Explore whether baseline data may be obtained from agricultural services; if not, a special survey is necessary</li> </ul>
	Improve the availability of small livestock (esp. egg-producing chickens) at the household level.	<ul style="list-style-type: none"> <li>• Proportion of households raising small livestock</li> </ul>			
	Improve the consumption of carotene- and retinol-rich foods, particularly among pregnant and lactating women and preschool children, produced by the family.	<ul style="list-style-type: none"> <li>• Frequency of consumption per week of vitamin A-containing foods by specific groups (6-11 m, 1-3 yrs, 4-6 yrs, pregnant, lactating)</li> </ul>	<ul style="list-style-type: none"> <li>• Consumption of carotene-rich foods at least three times per week, when available, by 80% of the target groups</li> </ul>	<ul style="list-style-type: none"> <li>• Before-after comparison</li> </ul>	



This five-year strategic plan to prevent and control vitamin A deficiency in Zambia serves as a model of a comprehensive, strategic plan for any country wishing to develop a micronutrient deficiency prevention and control program.