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Health Technical Services Project



**REVIEW OF USAID'S
MICRONUTRIENT PORTFOLIO**

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Glossary of Terms and Abbreviations

ACC	Administrative Committee on Coordination
AED	Academy for Educational Development
APHA	American Public Health Association
ASAPROSAR	NGO headquartered in Santa Ana, El Salvador
AVRDC	Asian Vegetable Research and Development Center
BASICS	Basic Support for Institutionalizing Child Survival
BCI	Behavior change interventions
BHR	Bureau for Humanitarian Response
CA	Cooperating Agency
CAMI	Central American Micronutrient Initiative
CCH	Corporation for Community Health
CEAPRED	Center for Environmental and Agricultural Policy, Research Extension and Development
CGIAR	Consultative Group on International Agricultural Research
CIDA	Canadian International Development Agency
CRSP	USAID sponsored research activity
CSM	Condom Social Marketing
COTR	Contracting Officer's Technical Representative
DALY	Disability Adjusted Life Years
DGLV	Dark green leafy vegetables
DHS	Demographic and Health Surveys
DOH	Department of Health
EDTA	Ethylenediamine tetra-acetic acid
EPI	Expanded Program On Immunization
FCHV	Female Community Health Volunteers
GON	Government of Nepal
GTZ	German Technical Cooperation Agency
HKI	Helen Keller International

HPLC	High Performance Liquid Chromatography
HPN	Health Population Nutrition
ICCIDD	International Council for Control of Iodine Deficiency Disorder
ICDDR,B	International Council for Diarrheal Disease Research/ Bangladesh
ICEPO	International Center for Epidemiology and Preventive Ophthalmology
ICN	International Conference on Nutrition
ICRW	International Center for Research on Women
IDD	Iodine Deficiency Disorder
IDRC	International Development Research Canada
IEC	Information, Education and Communication
IEF	International Eye Foundation
IFPRI	International Food Policy Research Institute
IIP	Institute for International Programs
ILSI	International Life Sciences Institute
IMCI	Integrated Management of Childhood Illness
INACG	International Nutritional Anemia Consultative Group
INCAP	Institute for Nutrition Central America and Panama
IPC	Interpersonal Communication
ISTI	International Science and Technology Institute
IVACG	International Vitamin A Consultative Group
JHU	The Johns Hopkins University
JSI	John Snow International
KAP	Knowledge, attitude, practices
LGU	Local Government Units
LME	Lactation Management Education
MCH	Maternal and Child Health
MOH	Ministry of Health
MRS	Research Center for Agricultural Sustainability
NFNP	Nutrition Plan of Action (El Salvador)
NGNESP	Bangladesh Homegardening Project
NGO	Nongovernmental organization
NID	National Immunization Day

NMAT	National Micronutrient Action Team
NMOP	National Micronutrient Operational Plan
NNIPS	JHU Study in Nepal
NNJS	Nepal Netra Jyoti Sangh
NPNE	National Program of Nutrition Education (El Salvador)
NSP	Nutritional Surveillance Program
NVAP	National Vitamin A Program
ODA	Overseas Development Administration
OMNI	Opportunities for Micronutrient Interventions
ORS	Oral Rehydration Solution
ORT	Oral Rehydration Therapy
OYB	Operating Year Budget
PAHO	Pan American Health Organization
PAMM	Program Against Micronutrient Malnutrition
PHC	Primary Health Care
PHN	Population, Health and Nutrition
PPAN	Philippine Plan of Action for Nutrition
PRP	Peer Review Panel
PVO	Private voluntary organization
QA	Quality Assurance
RFP	Request for Proposal
ROVITA	USAID-funded Indonesian Social Marketing/Behavior Change Project
SCN	Sub-committee on Nutrition
SIDA	Swedish International Development Agency
SPSP	Sangkap Pinoy Seal Program
STD	Sexually Transmitted Disease
UM	University of Michigan
UNAGRO	Sugar Fortification Program
UNDP	United Nations Development Program
USAID	U.S. Agency for International Development
VAC	Vitamin A Capsule
VAD	Vitamin A Deficiency
VITA	Vitamin A for Health

VITAL	Vitamin A Field Support Project
VITEX	Vitamin A project in the Philippines
VPI	Virginia Polytechnic Institute
WFP	World Food Programme
WINS	Women and Infants Nutrition Support Program

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Executive Summary

At the request of the Office of Health and Nutrition of the Global Bureau for Programs, Field Support, and Research (G/PHN/HN) of the U.S. Agency for International Development (USAID), a comprehensive review of the Agency's portfolio of contracts, cooperative agreements and other mechanisms for the furtherance of micronutrient research and field activities was undertaken by a six-person team, beginning in mid-October 1996. While looking at the portfolio in the context of all USAID support for micronutrient activities, **the review focused particularly on three funding mechanisms managed by G/PHN/HN:**

- **Opportunities for Micronutrient Interventions (OMNI): Authorization No. 936-5122**

- **Vitamin A for Health: Authorization No. 936-5116**

- **Food and Nutrition Monitoring and Support: Authorization No. 936-5110.**

The review was intended to assess the performance of these micronutrient initiatives, recommend changes to help the portfolio achieve its objectives more effectively, suggest medium- and long-term priorities, and surface ideas as to how to give micronutrients a stronger, more integrated profile within the totality of USAID programming.

As directed by the Scope of Work covering the review, the portfolio review team structured its examinations and conclusions around five subject areas: (1) the quality and availability of micronutrient services provided under USAID-funded programs; (2) the impact of services and research on policy development and resource allocation at international and country levels; (3) communication and behavior change strategies employed in furthering micronutrient awareness and related action; (4) the strengths, balance and applications of the micronutrient research agenda; and (5) the overall management of the micronutrient portfolio. An additional focus, touching on most of these areas, was on opportunities to stimulate greater involvement of the private sector in promotion of the consumption of micronutrients, especially through food fortification. The team

assessed both specific activity areas and the portfolio as a whole in the context of a “re-engineered” USAID, which is seeking to do its work with undiminished impact in an era of diminishing resources.

Most of all, the team sought to reach its own conclusions about the oft-repeated assertion that USAID has historically played an indispensable “leadership role” in international micronutrient research and program implementation, without which the field would be far less advanced. If anything, the team discovered this to be an understatement. Throughout the international health community, it found confirmation that USAID has indeed been the indispensable player in creating awareness of the negative, even fatal, consequences of micronutrient malnutrition in poor populations. **What understanding of, and commitment to, micronutrients does exist in the world, is due in large measure to the Agency’s pioneering efforts to have them understood as a key element of public health, and to put their universal acceptance and availability within reach.**

Evidence of this impact extends from USAID’s early support for ground breaking vitamin A research in Indonesia, to its sponsoring of countless expert meetings and support of the leading technical associations, to its involvement in bringing micronutrient interventions to scale in countries such as Nepal, the Philippines and Indonesia. **Under the funding mechanisms listed above, the importance of vitamin A supplementation to early child health has been proven categorically, and models developed to make possible national capsule coverage. Dietary diversification through the social marketing of vitamin A-rich foods has become a possibility worthy of further testing and evaluation.** The financial and technical viability of vitamin A, iron, and iodine fortification of food commodities has been proven, and important national fortification efforts launched in Asia and Latin America. **Efforts to make fortification an element of national policy have been shown to be particularly successful when the private sector has been involved as expert partner, and emphasis is placed on creating demand for fortified products. The review team urges a special effort to learn from, and create, private/public partnerships.** And dietary diversification is being studied for its potential as a long term solution to micronutrient deficiency, notably via a major evaluation of the Bangladesh home gardening project.

Going back as far as the 1970s, **the research component of USAID’s micronutrient portfolio has been especially vibrant**, effectively laying the technical and strategic groundwork for field implementation programs to follow. While its primary focus has been on applied research into vitamin A deficiency, important investments have also been made in research into iron deficiency

anemia and iodine deficiency disorders, and a start made at analyzing the importance of zinc to maternal and child health. Again, this research has been central to health policy making and resource allocation decisions in many countries. Current USAID-funded applied research on the impact of vitamin A, iron and zinc supplementation of pregnant women on maternal and infant outcomes, and of vitamin A on mother-to-child transmission of HIV, attest to the broad significance of the micronutrient research agenda to the entire field of international health. **The review team recommends a continued leadership role for USAID in VAD research, strengthened involvement in IDA and zinc research, and heightened attention to effective dissemination of research results, to ensure their application to field programs with no unnecessary delay.**

While fully convinced of the strength of USAID's commitment to micronutrients, and of the substance of its experience and current portfolio, the review team also noted problem areas which are hindering the micronutrient enterprise from reaching its full potential. **Within OMNI Field Support, currently the principle USAID-funded vehicle for implementation of projects in the field, the team felt the need for more intensive, integrated focus on a manageable number of countries.** OMNI FS currently has project activities of varying sizes and types in a long list of countries. OMNI Research also is funding a substantial list of operations research projects, often not in the same countries. The result is that impact is often fragmented and continuity in emphasis countries has suffered. This is not because of inattention to the problem. OMNI Research and OMNI FS in fact share project ideas and issues closely and regularly. Rather, it is a function in large part of OMNI's need to be responsive to requests from USAID and its Missions. The team urges a joint effort on the part of all concerned to help OMNI focus in an integrated manner on a reasonable number of "emphasis" countries, with regular on-the-ground management, and keep tangential countries to a minimum.

Uneven technical assistance and weaknesses in training and planning have rendered OMNI's communications capability less than fully effective. The team urges a full review of all communications priorities and activities, and an emphasis on accessibility and readability of information, featuring such things as short bulletins which summarize key "take home messages" emerging from research findings. It also suggests that clearer separation of the project communications and information dissemination functions of OMNI communications would enable each service to fulfill its mission more effectively, especially the difficult and, so far, poorly understood process of influencing behavior change. The establishment of a Communications Working Group

among OMNI partners would also enhance the program's linkages with both the research agenda and the policy development process.

Also problematic is the continued low level of enthusiasm for micronutrient initiatives within other areas of USAID, in particular in USAID Missions. In developing their Strategic Objectives, Missions have tended to emphasize familiar activity areas, such as family planning and HIV/AIDS prevention, and have not, with a few exceptions, "bought in" to the micronutrient agenda. African Missions in particular have been perceived as not being oriented to supporting nutrition- or micronutrient-oriented interventions. After an uncertain beginning, OMNI has begun to develop a better rapport with Missions, but many have felt that the micronutrient message was oversold, and not persuasively linked to local realities, nor Mission priorities. Focusing on a manageable number of emphasis countries (see above) will help this. So will working with regional groupings, such as those covered by the Southern Africa Initiative. **What is likely to be most persuasive, however, is access to lessons learned from successful interventions in other countries and regions; an awareness of local political and cultural realities** (in countries where "campaigns" are popular, vitamin A supplementation might be linked with EPI); **and a willingness to integrate micronutrients with other national and Mission priorities.** For example, the team urges serious consideration of a vigorous initiative to integrate micronutrient counseling and services into family planning/MCH service projects.

Management weaknesses were perhaps the most acute area of concern for the review team, particularly as regards OMNI. The management history of the OMNI Field Support contract has been a rocky one, as detailed in our report, starting with the selection of prime contractor and sub-contractors and their surprising miscalculations as to their respective roles in implementing such a complex project. Sub-contractors' dissatisfaction with their roles in OMNI led to bad feelings and poor communications, which were exacerbated by the contractor's own management problems. These included senior staff weaknesses and a poor level of communication between OMNI Field Support and OMNI Research, which is responsible for a small grants program to encourage operations research in connection with OMNI field activities. Fallout from these difficulties led to a high level of distrust about OMNI within USAID and in the wider micronutrient community.

Much of this distrust is undeserved. The review team found the OMNI staff to be motivated, hard working and technically competent. Thanks to the focus and even-handedness of current OMNI senior management, relations with and among sub-contractors have steadily improved. While there is still dissatisfaction on the part of some with their activity levels, a climate has been established within which

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they are better able to deal with these issues. The OMNI team in general sees the two years remaining in their current contract (or CA in the case of OMNI Research) as an opportunity rather than a limitation, and is committed to learning from hard lessons and, in particular, strengthening country programs. To give OMNI every chance to accomplish its objectives, **the review team urges an approach to oversight on the part of G/PHN/HN that allows for flexibility and innovation, but also one that features regular, scheduled discussions among the key players** (in addition to the sub-contractors' meetings) **to trouble shoot, assess progress, and exchange ideas.** On a separate, but related, management issue, **the team urges a complete review of the process by which funds allocated to the Micronutrient Reserve are themselves allocated to the various activities within the micronutrient portfolio.** A clear, rational process (no small task in a funding climate that is often irrational) will benefit all concerned.

The portfolio review team felt respect and admiration as it considered all that has been accomplished in the micronutrient field with USAID support, and focused its recommendations on ways it felt would maintain and increase the momentum. **While urging USAID to continue its leadership role in vitamin A research, it recommends as well an expanded research effort on iron deficiency anemia, strong consideration for supporting zinc research, and a hard look at multi-vitamin/mineral supplementation. It recommends an approach to operations research that is better coordinated with in-country implementation activities,** and thus has an improved chance of impacting behavior change. It urges energetic enlisting of the help of the private sector, in creating demand and drawing on established expertise, as the most effective long-term way of overcoming technical problems of fortification programs at minimal cost.

Finally, the review team urges consistent attention to two concepts which are highlighted on numerous occasions throughout its report. While not statistically quantifiable, we view them as essential in the qualitative sense to the overall strength and growth of the micronutrient portfolio:

One is continuity. The assurance of continuity is critical to developing and maintaining policy dialogue, program effectiveness and counterpart confidence in emphasis countries. Examples are cited where the presence or absence of continuity have been directly related to the success or ineffectiveness of interventions. Absence of continuity in training and message development has often prevented communications initiatives from fully realizing their central informational role. Continuity and consistency in articulating the micronutrient agenda, along with a willingness to adjust to local political and cultural realities,

will enhance the ability of USAID/Washington, its contractors and cooperating agencies to enlist hitherto reluctant USAID Missions in the micronutrient cause.

The second indispensable concept is collaboration. Vigilant attention to collaboration, for example, within and between agencies, between public and private sectors, between applied and operations research, will pay dividends in terms of more effective application of financial and technical resources. Failure to work together will have the opposite effect. **G/PHN/HN is urged to facilitate collaborative exchanges among USAID contractors concerned with micronutrients,** starting with joint meetings for the purpose of discussing the portfolio review report. **A vigorous effort to publish case studies of successful programs will provide the community with much needed new ideas. More frequent exchanges among international organizations,** such as the UN Sub-Committee on Nutrition and the Micronutrient Initiative, will lead to more effective partnerships, particularly in terms of timely sharing of opportunities and resources.

I. Introduction

A. PURPOSE AND RATIONALE OF PORTFOLIO REVIEW

Since 1965 the United States Agency for International Development has played a leadership role in international efforts to combat micronutrient malnutrition. It did so first through support for ground-breaking research which established the scientific basis for micronutrient interventions in preventing malnutrition and enhancing child health and survival. More recently, it has also supported efforts to test and replicate program and policy interventions to reduce micronutrient deficiencies, especially vitamin A deficiency, in Africa, Asia and Latin America.

USAID presently oversees a substantial portfolio of contracts, cooperative agreements and other mechanisms for the furtherance of micronutrient research and field activities. It has earned and maintains steady Congressional support in the form of an annual reserve now averaging between \$20 and \$25 million. At the same time, micronutrient programs are perceived as having a lower profile and fewer advocates within the Agency than, for example, family planning and other child survival efforts. USAID Missions in particular have been slow to embrace them, notwithstanding their potential impact and cost-effectiveness, and opportunities to further a program area of great promise have thus been missed.

The requested Portfolio Review of USAID's micronutrient program is intended to review the performance of its various elements, recommend changes to help the program achieve its objectives more effectively, and suggest medium- and long-term priorities. It is also hoped that the review will provide clues as to how to generate greater awareness of the importance of micronutrient malnutrition in

the broader health and development context, and a more proactive commitment to efforts toward its elimination.

B. METHODOLOGY OF THE REVIEW

Under the terms of a Scope of Work (SOW) drafted by USAID/Washington, a six-member review team was convened in Washington on October 14, 1996, to begin a series of consultations, meetings and country visits intended to give it the broadest possible exposure to USAID's micronutrient activities. Team members brought to the task a high level of technical expertise and many years of experience in micronutrient research, food supplementation and fortification, communication and behavior change, nutrition and child survival, public/private sector partnerships, and the management of complex programs.

Following two weeks of data gathering in Washington, team members dispersed for visits to four countries with USAID-funded micronutrient projects of varying maturity and complexity—Bolivia, El Salvador, Bangladesh and the Philippines. In the latter two countries, site teams were supplemented by micronutrient program specialists from GTZ-Indonesia. At the same time the team's research specialist conducted extensive visits with USAID-funded micronutrient research programs and institutions on the East Coast. Thereafter, the core team reconvened in Washington to discuss its findings and begin assembling its report.

As suggested by the SOW, the team focused its examinations in five subject areas: (1) the quality and availability of micronutrient services; (2) the impact of research and services on national policy development and resource allocation; (3) behavior change and communication strategies employed in furthering micronutrient awareness and related actions; (4) the micronutrient research agenda and its applications; and (5) overall portfolio management.

The team approached its exploration of these subject areas with five thematic objectives as guides:

- It sought to describe the results, achievements and consequences of addressing micronutrient deficiencies, especially vitamin A deficiency (VAD), under USAID's current portfolio of contracts, cooperative agreements (CA) and other funding mechanisms.
- It assessed the balance of the portfolio. Is there an appropriate balance between research and implementation? Should the Agency's historic emphasis on vitamin A be maintained? Has there been sufficient flexibility

within the funding mechanisms that USAID has used, or is a different configuration warranted?

- It looked at which elements of the portfolio have, over their lifetimes, been most and least productive, from the perspective of USAID and its Missions, national governments, and other international organizations.
- It placed great emphasis on recommendations for the future, in terms of research, policy and program implementation priorities.
- Finally, it assessed USAID's leadership role in micronutrient research and program implementation, vis a vis the Agency's other programs and those of other organizations.

C. STRATEGIC CONTEXT OF THE REVIEW WITHIN USAID

The Portfolio Review takes place at a time of considerable change in the USAID environment. As part of the Clinton Administration's "Reinventing Government" initiative, the Agency has embarked on a major re-engineering effort, centered on a program planning and implementation process built around carefully designed strategic objectives (SOs). Within the Office of Health and Nutrition, goals, or "results packages," for micronutrient activities are covered under guidelines set forth in SO 2 (Maternal Health and Nutrition) and SO 3 (Child Survival).

Re-engineering has involved USAID Missions fully as much as headquarters, with each required to develop their own SOs and results frameworks in line with their particular countries' needs and the Agency's overall priorities. As noted above, under pressure already to set family planning and other health objectives, Missions have been reluctant to spread scarce resources more thinly by taking on additional obligations in the form of micronutrient research or service projects. This is especially true in Africa, where Missions have been less oriented to supporting nutrition-related interventions.

This review affords a chance to look at micronutrients in the context of the re-engineering process, and to suggest ways of structuring the micronutrient portfolio so it is more obviously advantageous to the achievement of Agency objectives.

II. Technical and Financial Scope of Portfolio

A. RANGE OF ACTIVITIES

Micronutrient activities funded by this portfolio have primarily addressed intakes of micronutrients, although losses and increased requirements due to infections and physiologic status also play important roles in micronutrient status.

The portfolio has supported the following types of micronutrient activities:

- Research on the impact of micronutrients on morbidity and mortality
- Training/technical assistance for promotion of vitamin A supplementation
- Regional and country level fortification efforts
- Enhancement of micronutrient intake through dietary diversity
- International and regional conferences on micronutrient interventions
- National and regional surveys of micronutrient status
- Training of PVO and NGO staff in micronutrient issues

- Operations research to improve measurement of micronutrient status, fortification techniques, and cost effectiveness of program interventions.

Aside from the portfolio's focus on intake of specific micronutrients, there are other interventions that have been proven important to improved micronutrient status. These include promotion of exclusive breastfeeding and enhanced duration of breastfeeding, anti-helminthic treatment, prevention of malaria and other infections, and prevention of pregnancy and extension of postpartum amenorrhea. For the most part, these interventions have been left to other USAID projects, including the Environmental Health Project; African Malaria Initiative; Women, Infants and Nutrition Project (including LME, WINS, APHA, and ICRW Adolescent Nutrition Research Project); Expanded Promotion of Breastfeeding Project; Linkages; MotherCare; and BASICS.

B. FUNDING MECHANISMS COVERED BY THE REVIEW

The Scope of Work for this portfolio review covers activities by cooperating agencies funded under three mechanisms: Opportunities for Micronutrient Interventions (OMNI); Vitamin A for Health; and Food and Nutrition Monitoring and Support. The total amounts obligated to date are \$61.4 million. Most of these funds were expended between 1992 and 1996, but some agreements began in 1988. The funding mechanisms, the cooperating agencies, and funds obligated through June, 1996 are shown in Table 1¹.

1. Opportunities for Micronutrient Interventions (OMNI)

OMNI is the newest funding mechanism for micronutrient programming. It began in 1992 and will continue until 2003. While often referred to, in this report and elsewhere, as the generic "OMNI", it in fact has three components:

- OMNI Field Support (OMNI FS) is a contract with John Snow Incorporated (JSI) and eight sub-contractors: Helen Keller International (HKI), the Manoff Group, PATH, the International Life Sciences Institute (ILSI), Johns Hopkins University (JHU), the University of California at Davis, Emory University, and the University of Arkansas. Activities conducted under this contract are numerous, including at least four comprehensive country programs, technical assistance on micronutrient programs in over twenty-five countries worldwide, national surveys to assess micronutrient status, and global

¹ In addition, the research component included a review of research conducted under VITAL (Vitamin A Field Support Project), which was the predecessor of OMNI. While additional research was conducted under the IMPACT project, the review of this research was not as in depth as the other research discussed in this report.

leadership activities, such as support for workshops and conferences on pertinent micronutrient issues. Funds obligated to date under OMNI FS total \$19.8 million under the core contract and \$6.8 million under the requirements contract, for an overall total of \$26.6 million.

Table 1. Funding Mechanisms, Cooperating Agencies, and Obligated Funds for Projects Included in this Portfolio Review			
Funding Mechanism	Dates	Cooperating Agency	Obligated Funds
Opportunities for Micronutrient Interventions (OMNI) Project Authorization (12/92-9/03) \$51 mil. ceiling	9/93 to 9/98	OMNI Field Support (JSI and subcontractors)	\$19.8 mil. core \$6.8 mil. buy-ins
	9/93 to 9/98	OMNI Research (ILSI and ICRW)	\$5.1 mil.
	12/95 to 12/97	UNICEF-Eritrea	—
Vitamin A for Health Project Authorization (8/88 to 9/97) \$36.9 mil. ceiling	8/85 to 9/96	Johns Hopkins University ICEPO and IIP	\$19.9 mil.
	8/90 to 9/97	Helen Keller International Indonesia, Philippines, Bangladesh	\$5 mil.
	8/90 to 9/97	International Eye Foundation	\$500,000
	9/90 to 9/95	Florida State University	\$225,000
Food and Nutrition Monitoring and Support Project Authorization (7/89 to 6/98) \$17.8 mil. ceiling	9/90 to 9/97	IMPACT ISTI (with subs to IFPRI, Tulane, and VPI)	\$4.5 mil. (+ \$3.3 mil. buy-in)
	9/92 to 9/95	Program Against Micronutrient Malnutrition Emory and CDC	\$1.2 mil.
	9/92 to 9/97	Peace Corps	\$925,000
	6/93 to 12/96	IFPRI	\$918,000

- OMNI Research consists of a cooperative agreement (CA) with ILSI, along with a sub-contract with the International Center for Research on Women

(ICRW), that funds operations research projects. Funds obligated to date under the agreement total \$5.1 million.

- The smallest component of OMNI consists of funds designated for UNICEF in Eritrea for iodine-related activities.

2. Vitamin A for Health

The Vitamin A for Health program (\$25.6 million obligated) has funded research on micronutrients conducted by Johns Hopkins University (JHU) and collaborators at a level of \$19.9 million. Through Helen Keller International (HKI), it has supported comprehensive country programs for vitamin A in Indonesia, the Philippines (VITEX Project), and Bangladesh, at a level of \$5 million. It has funded the work of the International Eye Foundation (IEF) on behavior change programs to increase vitamin A consumption through dietary interventions in Central America. And it provided Florida State University with \$225,000 for research on solar drying.

3. Food and Nutrition Monitoring and Support

The majority of funds obligated for this program (\$7.8 million out of a total \$10.8 million) went to support IMPACT (the Food Security and Nutrition Monitoring Project). IMPACT is managed by ISTI with sub-contracts with IFPRI, Tulane, and Virginia Polytechnical Institute. It consists of collaborative inquiries to define indicators of nutritional status and agricultural programs (conducted primarily by IFPRI), technical assistance to institute monitoring systems, training in food and nutrition monitoring, and dissemination of information on such systems. Because IMPACT received a mid-term evaluation, and many of its elements are not focused on micronutrients, it did not constitute a major focus of this portfolio review.

The Program Against Micronutrient Malnutrition (PAMM) (9/92-9/95) was a three-year initiative, funded at a level of \$1.2 million through Emory University, to provide training and technical assistance in micronutrient interventions. Two other components funded through this mechanism consist of awards of approximately \$1 million each to Peace Corps, for interventions to increase dietary diversity, and to IFPRI, for research on increasing micronutrients in staple foods and through fish culture. In addition, funds have supported adding nutrition components to agricultural surveys.

4. Other Funding Mechanisms for Micronutrient Activities

Additional monies are spent by USAID on micronutrient activities that are managed through other funding mechanisms. In order to assess how this portfolio review relates to overall USAID expenditures for micronutrients, see Table 2.

Table 2. FY 1996 Micronutrient Reserve Funding Allocations

Allocations	OYB Core Funds	Field Support	Inter-agency Review of Additional Micronutrient Reserve	Total
Global Bureau				
OMNI Field Support Contract	2,170,000	422,000	2,590,000	5,182,000
OMNI Research CA	1,400,000	0.00	0.00	1,400,000
JHU CA	1,875,000	0.00	2,410,000	4,285,000
HKI/Bangladesh	425,000	1,400,000	750,000	2,575,000
HKI/Philippines	425,000			425,000
Global Total	\$6,295,000	\$1,822,000	\$5,750,000	\$13,867,000
Other				
BASICS			925,000	
DHS/MACRO			135,000	
ICDDR,B			435,000	
JHU/FACS			800,000	
WHO/CHD			200,000	
MotherCare			300,000	
Other Misc. (PSN/AED, FHI, Bean Crsp, CARE, STC, WVWR, AVRDC, MARD, IRRI, WRC, HOPE, IIN, BHR/USDA)			3,958,600	
Subtotal (Other)	0	0	\$6,319,035	6,319,035.00
TOTAL	\$6,295,000	\$1,822,000	\$12,069,000	\$20,186,000²

²Additional funds were also available in the pipeline (allocated in previous years but not spent) to organizations such as International Eye Foundation, IFPRI, IMPACT, and Peace Corps.

Table 2 shows total FY96 obligations for micronutrient activities, approximately \$20 million. Data on such allocations for previous years are not available. The table shows that out of the \$20 million, slightly more than half was spent through funding mechanisms included in this portfolio review.

C. FY 1996 MICRONUTRIENT RESERVE ALLOCATION PROCESS

Each year Congress sets aside funds within its foreign aid appropriations for micronutrient activities. Previously referred to as an "earmark," these funds are now designated under a "reserve" or "directive," which, since 1993, has averaged between \$20 and \$25 million.

The FY 1996 micronutrient directive was at the \$20 million level (out of an overall USAID allocation for health and population of \$544 million). Of this, about \$6.3 million was allocated to the Global Bureau of USAID through the operating year budget (OYB), \$1.8 million programmed through bilateral projects (with field support funds), and \$12 million allocated through a "competitive" process in which an Agency-wide Nutrition Working Group reviewed proposals from missions and cooperating agencies and selected activities to be funded (see Table 2). Of this allocation, the working group obligated 33% for Africa, 36% for Asia, 26% for Latin America and the Caribbean, and 5% for Global. Funds were distributed at 62 percent for vitamin A, 37 percent for iron, and 2 percent for iodine-related activities. Forty-eight percent (48%) of the funds were allocated to Joint Programming countries. About 70 percent of the \$12 million went to cooperating agencies covered in this review.

In making decisions on allocating the micronutrient reserve, USAID staff have had to operate under constraints that have made the process especially difficult. For example, in 1996, funds were not available until late in the fiscal year, requiring a quick turnaround for their allocation. This left little time for a truly competitive process before decisions were made, although an attempt was made by members of the Nutrition Working Group, as in previous years, to determine what proposals should contain and what the priorities for funding would be.

Several staff within USAID raised concerns about the allocation process of funds. For example, it included e-mails sent to Missions requesting short (generally one page) proposals for funding. Some cooperating agencies were informed that they could send in proposals, while many others were not so informed (e.g., the OMNI Field Support sub-contractors). The Nutrition Working Group met several times to determine the criteria upon which decisions were to be made and then met again several times to approve or disapprove requests. However a rating sheet was not developed which would have made the allocations more objective, nor

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were comments given to submitters as to the reasons for either accepting or rejecting their proposals. The working group is struggling to come up with the best process for making allocation decisions, since they want to be able to respond flexibly to Mission needs without creating heavy management burdens, either for Missions or Bureau staff. Many urge a more competitive process, one which employs criteria already used by USAID to judge unsolicited proposals, with results of reviews provided to applicants.

The portfolio review team realizes that USAID staff have struggled to make the process for allocation of the micronutrient reserve as fair as possible, and furthermore that the FY 1996 situation was somewhat anomalous. Indeed, for FY 1997, funds have already been allocated proportionally to the bureaus by the USAID Budget Office, with each bureau required to manage decisions as to how these funds will be distributed. Nonetheless the team urges that the process be thoroughly and jointly reviewed by G/PHN/HN, other concerned USAID management, and contractors to determine whether it is as fair and adaptable as possible. A first step might be to assess the quality of the projects funded in FY 1996 under the existing process to determine the impact of previous decisions.

D. GEOGRAPHIC CONTEXT

Table 3 illustrates the level of country-specific activities included in the USAID portfolio by indicating relative amounts of funding provided. Comprehensive programs funded through this portfolio were focused on a few major countries (Indonesia, Bangladesh, Philippines, and Nepal), primarily through HKI and OMNI Field Support. Less comprehensive activities have taken place in Bolivia, El Salvador, Nicaragua and Guatemala, among others. Activities are just beginning in several African countries.

Of the 15 USAID-designated "Joint Programming" (highest level of emphasis) countries shown in this table, major activities took place in only four countries but some activity took place in all of them. Of the 24 "Joint Planning" countries, moderate levels of activity took place in seven countries and some activities took place in 13.

RECOMMENDATION

- There should be a full review of the process by which micronutrient funds are allocated from the Micronutrient Reserve to the various activities/agencies within the portfolio, to ensure that funding is consistent with USAID's strategic focus and that the process is clear and rational to all concerned.

Table 3. Micronutrient Activities for Joint Programming Countries in this Portfolio through Aug. 1996 ¹								
Africa	Pop. size 10 ⁶	Micro. Activ.	Asia/Near East	Pop. size 10 ⁶	Micro. Activ.	LAC	Pop. size 10 ⁶	Micro. Activ.
Ethiopia	53	*	Bangladesh	118.	***	Peru	23	*
Ghana	17	*	Egypt	62	*			
Kenya	27	*	India	919	**			
Nigeria	109	*	Indonesia	195	***			
South Africa	41	*	Morocco	27	*			
Tanzania	29	*	Nepal	21	***			
Uganda	21	*	Philippines	66	***			
Joint Planning Countries								
Benin			Jordan			Bolivia	7	**
Eritrea		*	Yemen			D.R.	8	
Guinea						Ecuador	11	**
Guinea-Bissau			Ukraine		*	El Salvador	6	**
Madagascar	14	*	Romania			Guatemala	10	**
Malawi	11	*				Honduras	6	**
Mali		*	West Africa			Jamaica		
Mozambique	16	*	Southern Afr			Nicaragua	4	**
Niger	9	*	Greater Horn Af			Paraguay		
Senegal	8							
Zambia	9	**						

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Table 3. Micronutrient Activities for Joint Programming Countries in this Portfolio through Aug. 1996 ¹								
Africa	Pop. size 10 ⁶	Micro. Activ.	Asia/Near East	Pop. size 10 ⁶	Micro. Activ.	LAC	Pop. size 10 ⁶	Micro. Activ.
Special Circumstances Countries								
Rwanda/Burundi			Cambodia			Brazil		
			Pakistan			Colombia		
			West Bank/Gaza			Mexico	92	*
			Russia			Haiti	7	
			Turkey					
Other Countries								
			Sri Lanka	18	**			

1 *** High levels of funds (at least \$1 million spent), ** Moderate levels of funds (Over \$400,000 spent over three years), * Some funds (Up to \$400,000). See Supplement 1, page 93. This does not include funds spent for large-scale JHU research.

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III. Portfolio Analysis

A. QUALITY AND AVAILABILITY OF MICRONUTRIENT SERVICES

1. Findings

Improvements in micronutrient status have been made possible under the USAID portfolio through services in three distinct areas: **pharmaceutical supplements**, **food fortification** and **dietary diversification** (increasing dietary intake of micronutrients). These services address two of USAID's principle program objectives, stated as Intermediate Results (IR) to be achieved under Strategic Objectives 2 and 3:

IR 2.1: Selected nutrition interventions to improve womens' health and pregnancy outcomes identified, developed, evaluated and disseminated.

IR 3.4: Improved quality and availability of key child health and nutrition services.

Supplement 2, page 97, outlines in greater detail the services and associated indicators of progress in achieving these IRs.

a. Pharmaceutical Supplements

Many countries now have programs to provide vitamin A capsules every six months (or more frequently) to children 6-60 months of age. Increases in effectiveness of such supplementation programs have been seen since 1993, when

several countries began linking the provision of supplements to immunization campaigns or promoting them through special "vitamin A days". As indicated in Box 1 (page 17), in a few such countries where good data have been developed, documented coverage rates for children under five now exceed 80%.

The lack of reliable data remains an impediment to developing a more comprehensive picture of vitamin A coverage in countries being served by USAID-funded programs. OMNI³ reports that 13 out of the 15 USAID Joint Programming countries have some supplementation activity. UNICEF states that out of 43 countries severely affected by vitamin A deficiency, 22 were routinely providing vitamin A supplements for young children and 11 were covering more than half of the young child population⁴. But with the exception of countries described in Box 1 and one or two others (e.g., Indonesia), useful coverage data are generally not available. While OMNI estimates that, in the 15 Joint Programming countries as a whole, vitamin A supplementation will achieve 51% coverage by 1998 and 76% coverage by the year 2005, these figures are based on incomplete baseline information and/or very limited surveys.

Other information gaps are similarly pronounced. For example, data are generally not available to demonstrate whether children not reached during one campaign are the same who are not covered by the second annual campaign or whether those reached are from high risk groups. Also, little information is available on the costs of these programs. And whereas many countries provide vitamin A supplements through the health care system as one of the associated treatments for childhood illnesses, data on the number of countries where such protocols are currently in place are not available. A thorough review of information needs and gaps in connection with planning for supplementation programs and other country initiatives, with particular emphasis on coverage data, would greatly enhance the potential for assessing impact.

An additional concern in many quarters is that the benefits of supplementation campaigns can be over stressed. Campaigns are artificial, often short-lived mechanisms for achieving immediate goals. As soon as campaigns have produced desired levels of acceptance and participation, it will be desirable for national programs to try to phase them out and to make supplementation a regular part of the integrated management of childhood illness, along with routine immunizations offered out of health facilities or during household visits by community health

³ OMNI Strategy and implementation plan. Revised 8/96. Johns Snow International, Rosslyn VA.

⁴ UNICEF. Progress of Nations. 1996.

Box 1

How Has the Portfolio Enhanced Service Delivery of Supplements to Children?

Bangladesh: Coverage rates in 1995 exceeded 80%, up from 42%-55% between 1990-1994 when supplements were distributed door-to-door by MOH workers. The increase in coverage was due to the distribution of supplements during the second of two polio vaccination days in March and April 1995 when families brought their children to vaccination sites. Following this success, the government organized a week-long national mobilization campaign in November 1995 with capsules distributed through outreach centers.

Raising the profile of vitamin A capsules in the eyes of the health workers and in the population was a key issue in the increase in coverage. The nutrition surveillance system operated by HKI (and supported through local USAID mission funds) in conjunction with local NGOs, which collect and report data, made the assessment of coverage possible.

Philippines: Under its cooperative agreement, HKI conducted a baseline survey in 1991 and a follow-up survey in 1994 of 11,000 preschool children (6-83 months of age) in 120 randomly selected villages in three provinces. **In 1991, coverage with vitamin A supplements was only 1-10%. After a change in the Department of Health's approach, providing universal supplementation rather than targeted supplements to undernourished children, the coverage rate increased to 87% and statistics showed a significant decrease in night blindness.** The follow-up survey also found that children were more likely to have been given a capsule if their mothers knew the benefits of vitamin A.

The Philippines is an example of the role played by HKI in program support. The portfolio review team found that while it is impossible to quantify the contribution of HKI to successful vitamin A supplementation, its work has been extremely useful and at times essential in the choice, development and management of the distribution mechanisms. In the late 1980s, the general opinion in the Philippines was that vitamin A supplementation was not beneficial and could have toxic effects. Since that time, thanks to HKI's USAID-supported activities, this attitude has changed completely.

Nepal: As a result of assistance provided by OMNI Field Support through HKI, the national vitamin A supplementation program has been able to train 14,000 Female Community Health Volunteers who distribute capsules every 6 months during two-day campaigns. **Initiated in 1993, the program now has a coverage of 86% of children under age five in the 32 target districts, covering about half of Nepal's population.**

workers. Such routine, integrated approaches to services have greater potential for impact over the long haul.

In most countries with programs for vitamin A supplementation of children, there are also guidelines on supplementation of mothers in the postpartum period. But because of the low percentage of births attended by health professionals, recorded coverage levels of women are likely to be lower than those for children. There is little program experience in this area, and operations research on ways to encourage and document postpartum supplementation could be most beneficial.

In addition to promoting enhanced vitamin A intake among children, OMNI Field Support has chosen improvement of iron intake among young children as a focus because high rates of iron deficiency are seen throughout most developing countries. For example, 50% of older infants in the Philippines and nearly two-thirds of children aged 12 to 36 months in India are anemic. Within the USAID micronutrient portfolio, efforts to reduce anemia in children have consisted largely of research by Johns Hopkins University and OMNI Research (ten of its operations research projects have had a primary focus on iron), national surveys to assess anemia status, and workshops on the topic organized by OMNI FS and OMNI Research. Interventions to improve iron status among young children through supplementation have not as yet been a major focus of service delivery activities.

Other than research, background reviews and surveys, few activities within the portfolio have addressed anemia in women, and particularly iron/folate supplements to pregnant women. This was due to a policy decision by OMNI to focus in other areas, on the understanding that the World Bank was concentrating on women and iron. In fact, the World Bank has not done as much as expected, and OMNI along with MotherCare is moving to fill the void, having begun iron supplementation activities in Bolivia, India and Indonesia. But iron programs still lag far behind those of vitamin A, this despite the fact that reducing levels of anemia has been shown to have health benefits as significant as vitamin A and greater than those for immunizations, and at an acceptable cost (see Supplement 3, page 99, for World Bank figures comparing cost effectiveness of different interventions).

Finally, research funded under this portfolio and through previous USAID-sponsored activities (including VITAL and the CRSP) have shown high proportions of women and children with multiple micronutrient deficiencies. The review team urges careful consideration of the possibility of addressing this problem through multiple vitamin/mineral supplementation.



b. Fortification

Although interest and activity in Asia is growing, most food fortification activities supported within this portfolio have been focused on countries in Latin America, where there has been success with fortification of salt with iodine and sugar with vitamin A, and increasing attention to fortification of wheat and corn flour with iron (see Box 2). Guatemala, Honduras and El Salvador have ongoing national sugar fortification programs, and are significantly increasing coverage. Advances are also occurring in the improvement of fortification technology. Close collaboration with PAHO in Latin American initiatives has contributed to their impact.

So far, fortification efforts have primarily been aimed at staple foods consumed by the general population. There has been some international advocacy by OMNI FS and OMNI Research on the use of fortified complementary foods for young children that could play an important role in meeting micronutrient needs of toddlers (see Supplement 4, page 101).

Severe micronutrient deficiencies in refugee camps became apparent during the period covered by the portfolio. In response, the IMPACT project has worked with the Bureau for Humanitarian Response (BHR) to train PVO personnel working in refugee settings and has supported the production of the UN's Refugee Nutrition Information System bulletins. OMNI FS funded a report on "Micronutrient Fortification and Enrichment of P.L. 480 Title II Commodities: Recommendations for Improvement. 1994" A recent meeting hosted by the USDA on fortification of foods distributed under P.L. 480 resulted in a mandate to increase levels of micronutrients in many commodities.

c. Dietary Diversity

Encouraging and facilitating dietary diversification in developing countries is the longest term strategy for addressing micronutrient deficiencies. The most common approaches have been through (1) IEC and social marketing activities to encourage increased consumption of available foods high in vitamin A or provitamin A carotenoids (discussed later in the behavior change section of this review); and (2) expansion of available food production and increased consumption of such foods through home gardening. Such efforts have been conducted by HKI in Bangladesh, OMNI FS in Indonesia and Nepal, IEF in Guatemala, and Peace Corps in countries where it is active. Other pilot diversification efforts have included solar drying of seasonal fruits high in provitamin A carotenoids for use during other seasons.

Box 2**How Has the Portfolio Enhanced Fortification Programs?**

In **Bolivia**, the OMNI resident advisor has been influential in coordinating the activities of many sectors in fortification of sugar with vitamin A. OMNI and UNICEF have co-funded the advertising campaign for *Vitazucar*, a fortified sugar, and they and other members of the interagency micronutrient group have encouraged the government's efforts to legislate the fortification of wheat with iron and B vitamins. An important impetus for the legislation was its use as a major focus of the South American Summit of First Ladies that was hosted by Bolivia in Santa Cruz, December 1996.

Bolivia represents a major success story in fortification of salt with iodine. While a 1967 law had required salt fortification, not until the 1980s did a mass campaign encouraging consumer demand and technical support to small-scale salt producers result in the near elimination of goiter among school children, from 65% in 1983 to 4.5% in 1994. The cost of this effort was only about \$4 million. Success in all of these efforts was enhanced by the full participation of the Bolivian private sector, especially sugar and salt manufacturers, with the government.

In the **Philippines**, HKI and the OMNI FS Resident Advisor have worked with the government on the development of the logo used to identify fortified foods (*Sangkap Pinoy*). To date, three products use this government seal of approval (margarine, sardines and orange drink). The margarine especially is a low-cost item that is usually purchased in small quantities by lower income consumers. Recent placebo-controlled trials in one province illustrated the impact of fortified margarine on serum retinol levels. Funds have also been provided to test fortification of rice with iron and wheat flour with vitamin A.

The **Central American Micronutrient Initiative (CAMI)**, recently initiated with USAID support to overcome barriers to fortification of foods, illustrates a successful regional collaboration between governments, research institutions, the private sector and donor agencies. An important early accomplishment of CAMI has been to identify the components that are essential to increasing the availability of adequately fortified foods in a given country:

- 1) Increased demand for and supply of fortified foods
- 2) Improved policy environment
- 3) Improved quality of fortified foods

Fortification can also have economic benefits, whether from income derived from export of fortified products, or from increases in work output associated with reductions in iron deficiency. Fortification of wheat with iron in **Sri Lanka** meets the USAID Missions's strategic objectives for economic growth because of the impact of anemia on work output. Flour millers in Bolivia supported legislation to fortify flour because it would reduce imports of flour from Argentina.

The importance to dietary diversity of including animal products as a strategy to improve vitamin A status is suggested by research showing that consumption of some fruits and vegetables may not improve serum retinol levels in mildly deficient populations. As stated by Sommer and West,⁵

“Given available data, there is ample reason to suspect that a minimum amount of preformed vitamin A, at least occasionally, may be essential.”

However, it should be noted that in many countries increasing vegetable sources is the primary dietary strategy available, and gardening also has an economic impact on households that may indirectly improve animal sources and fat consumption.

There are important differences between the HKI approach to dietary diversification and other, smaller scale projects such as those of IEF and Peace Corps (Box 3). The HKI approach in Bangladesh included an infrastructure sufficient to provide the needed agricultural inputs and technical expertise to ensure that the advice given on gardening could be followed. Because a monitoring system was built in, the impact on production and consumption could be assessed. Such components were not included in other projects.

2. Lessons Learned

a. Extent of Country Programs

Implementation of country-level micronutrient programs has largely been the province of OMNI FS and HKI. HKI has played the lead role in major programs to increase the quality and availability of micronutrient services in Indonesia, Bangladesh, the Philippines and Nepal. It has done so either in its capacity as an OMNI subcontractor (e.g., Nepal) or using funds from its own USAID cooperative agreement (Philippines). OMNI FS itself supports integrated programs (those with a variety of activities in a given country) in several countries, including the Philippines and Bolivia, where it has in-country representation, El Salvador and other Central American countries, Peru and India. It also has a limited (one activity) presence in several other countries, such as support for wheat flour fortification in Sri Lanka and beginning initiatives in selected African countries.

⁵ A. Sommer and K. P. West. Vitamin A Deficiency: Health, Survival and Vision. Oxford University Press. New York. 1996.

The issue of country coverage is complex, especially as one seeks to make recommendations for rationalizing country priorities in the future. For example, it was not clear to the review team whether it makes sense for OMNI FS to establish a formal presence in a country, such as the Philippines, where HKI has long been

Box 3

How Has the Portfolio Enhanced Dietary Diversity?

Bangladesh. While home gardening has been encouraged by NGOs and many governments over the last several decades, it is only recently that such projects have been promoted at a level seen in Bangladesh, where the HKI program currently has 288,000 home gardeners reaching over 1.6 million beneficiaries. Two thousand village nurseries, themselves self-sustaining micro-enterprises, have been established to produce seeds. Home gardens are promoted for year-round production and the promotion of several varieties helps reduce the risk of pests and diseases. Local men and women “social marketers” give educational talks to encourage consumption of vitamin A-rich foods. It has been necessary for HKI to assume a coordinating role in the supply of seeds and other inputs. This role is one that is neglected in many smaller projects.

Bringing the program to scale through partner NGOs has reduced per garden implementation costs while helping the NGOs become more effective. Dissemination of information on home gardening through a variety of channels (television, radio, wide circulation of reports) has had a major influence on the commitment to home gardening by NGOs, donors and the government. The cost of the pilot project was \$25 per garden (over a three-year period). The estimated cost per garden in the expanded program was \$8.30.

The work of HKI, supported under the USAID micronutrient portfolio, has for the first time begun to document the fact that an increase in the variety of vegetables grown in a home garden significantly affects a mother's vitamin A intake. An evaluation is being planned to more fully assess the impact of the program on nutritional and health status, including biochemical indicators of micronutrient deficiency, the link between home gardening and health outcomes, and the impact of home gardening and improved consumption of vitamin A rich foods on iron status in women. The ICDDR,B has been given funds through the USAID Micronutrient Reserve to take the lead in implementing this ground-breaking evaluation, with technical assistance from JHU. This will have the effect of building capacity within ICDDR,B to design and conduct such evaluations in the future.

prominent and effective, while it has no presence in a country like El Salvador, where it (OMNI FS) is struggling to get a number of activities up and running. Especially in cases where HKI is functioning as an OMNI subcontractor, it seems cleaner to simply assign it full responsibility for a particular country program and then get out of the way. Such has been the approach in Nepal, with very positive results in terms of ensuring program impact and minimizing duplication of effort. As will be noted more than once in this report, the portfolio review team felt that OMNI FS would be well served if it could focus on developing more comprehensive programs in fewer countries, to avoid either the perception or reality of being overly fragmented. We understand that this is easier said than done, especially given the complexities of working relationships between contractors, the USAID Global Bureau and USAID Missions.

OMNI FS is bound to respond to Mission requests, indeed is anxious to receive such requests, especially from African Missions which, as noted elsewhere, have not been micronutrient program enthusiasts. (Eritrea became an instant focus country as a result of a Mission request with substantial funding attached). But the team feels that the “more comprehensive programs/fewer countries” model should, notwithstanding its constraints, be a goal for OMNI FS because of its potential for greater coverage and impact at lower per capita cost in countries so selected. As suggested later in this report, treating regional groupings of countries as units might make such a strategy more palatable.

b. Sustainability of Vitamin A Capsule Distribution

Availability of vitamin A supplements and the costs associated with mass distribution of capsules has caused many countries to begin to reassess their program design, especially as health systems become decentralized. A revised approach is being considered that would develop fortification or dietary diversity strategies to ensure reaching a large proportion of the local population in greatest need. Few countries, however, have data on costs of supplementation programs and alternatives, such as targeting supplements for populations at special risk. A study conducted by VITAL in Guatemala illustrated that the cost per high risk person achieving adequate vitamin A status was least for fortification and highest for food production/education (\$.98 for fortification, \$1.68 for supplementation, \$3.10 for food production/education).⁶

⁶Phillips, M. et al, The costs and effectiveness of three vitamin A interventions in Guatemala. *Social Science and Medicine* 42(12): 1661-1668. 1996.

USAID efforts to support the Integrated Management of Childhood Illness (IMCI) initiative and the distribution of supplements to sick children will help in this new approach. But outreach into the community to provide services to children who do not attend IMCI clinics will still be needed.

Program guidelines are needed for gradually reducing the emphasis and scope of vitamin A supplementation while fortification programs emerge and are determined to be functioning well. Vitamin A capsule distribution should then be targeted to population groups not being adequately reached with fortified foods, especially those living in absolute poverty.

The OMNI FS cost-effectiveness analyses being conducted in South Africa, the Philippines, Indonesia, Egypt and Peru will help to develop the methodology needed for countries to make decisions on future micronutrient interventions. This is an important step towards helping make such interventions sustainable.

c. Approaches to Fortification

Many governments have enacted legislation making fortification compulsory (see Supplement 5, page 103). When the need for such legislation is properly communicated to all concerned, there is generally a positive response from the food industry, whereas inadequate or inaccurate communication tends to turn industry against a fortification initiative. One key to positive private sector involvement is to obtain the support, again through careful and accurate communications, of international industrial associations. These would include groups such as the International Sugar Organization, when promoting fortification of sugar with vitamin A, and the Latin American Wheat Flour Association, when considering fortification of wheat flour with iron.

While some fortification efforts have been implemented through legislation requiring that certain foods be fortified, in other cases the private sector has moved ahead without legislative mandates. (Supplement 6, page 105, lists a number of private sector fortification initiatives that have succeeded without legislation. Supplement 7, page 107, compares the experiences of two countries in which OMNI FS is active. The first, El Salvador, legislated the fortification of sugar with vitamin A; the second, Bolivia, worked through the voluntary fortification efforts of one private sugar manufacturer.) In so doing it has shown that the single most important key to successful private sector involvement with fortification is consumer awareness. If a population is adequately informed as to the value, in terms of its health and well-being, that will be added to a particular staple food commodity through the introduction of a fortificant, it will become a

willing consumer of the product, as illustrated, for example, by the success of fortified margarine in the Philippines.

Many have suggested that once fortification has been legislated consumer knowledge is unimportant. But the review team feels strongly that increasing consumer demand for fortification, even when it is legislated, is essential to success of a fortification program. In Ecuador, while the previous government legislated fortification of wheat, once the new government took office, the fortification effort was not implemented and is still being considered. One of the problems had been that the public, press and academic community had not been sufficiently involved so that the new government was not compelled to continue the process without a further policy review. This has delayed the effort, and again illustrates the importance of accurate, far-reaching and sustained communications.

Another lesson learned is that the process for determining the need and demand for fortified foods among poor populations, which has been clearly defined in many VITAL, OMNI, IVACG and INACG documents, is not being practiced in the field. The level of consumption by the at-risk population of foods selected for fortification is often not known. Rather, foods (such as flour or sugar) are selected because the technology is known and has been used elsewhere, despite the fact that fortification of many other staple foods is feasible from a technical and cost point of view. Food consumption data needed for the appropriate selection of fortification vehicles have often not been available. The use of multiple foods for fortification, resulting in lower amounts of fortificants being used in any one food (and thus costs per food reduced), has not often been tried.

Continuity of technical assistance is needed to address some of these issues as well as the many technical concerns that arise in the process of developing national fortification plans. USAID, through OMNI FS, should continue to promote fortification and to give technical and financial support to expedite the timely transfer of technologies that are being developed to improve fortification processes and ensure quality of fortified foods.

d. Enhancing Dietary Diversity Through Home Gardens

Few home garden projects have been evaluated for their impact on vegetable production, improved dietary consumption or improvement in vitamin A status. Where such evaluations have been done (as in Bangladesh), they have so far been largely informal. (See Box 3, page 22, for a description of a more formal, upcoming evaluation.) But what evidence has been gathered supports the role of gardens in improving consumption of micronutrients at relatively low cost, as

compared to consumption patterns when people only depend on the local market. Most smaller scale efforts have not been evaluated to provide sufficient information to assess their impacts. Assessment of Micronutrient Status/Monitoring of Program Coverage.

Assessment of the micronutrient status of different populations and monitoring of program coverage have been important components of USAID's Micronutrient Portfolio. As stated by UNICEF:

“recent experience has shown that a reliable national survey, using biochemical indicators of vitamin A status, has been a prerequisite in mobilizing the necessary political support for activities to improve the situation”⁷.

Much of USAID's involvement in vitamin A supplementation has been through surveys pointing out the prevalence of vitamin A deficiency (Bolivia, Peru, Indonesia, Nepal, and a recently completed survey in Morocco) and evaluations of coverage and/or impact of national or regional program efforts (in the Philippines, Bangladesh and Nepal). However, once baseline surveys have been conducted, other means to assess program coverage or impact should be considered. Surveys are expensive, take a long time to analyze, and thus are unable to provide the data programs need quickly.

More collaboration is needed with other (non-micronutrient) health projects so that integrated monitoring of programs can be done more easily, quickly and at lower cost, providing information that can be used to improve program coverage and cost-effectiveness. A good example of this has been OMNI FS's active collaboration in program monitoring with MotherCare (in Bolivia and Indonesia), BASICS (Zambia, Eritrea), SEATS (Eritrea) and the Linkages Project (Madagascar). Systems to monitor the use of local health services (including vitamin A supplementation efforts) would help to provide the data needed to assess program effectiveness.

e. Private Sector Involvement

It is clear that the private sector has much to offer in improving the quality and reach of micronutrient services. As programs move from a health services intervention (distribution of supplements) to fortification, the expertise of the

⁷ UNICEF. Update on micronutrients UNICEF-USAID program strategies and technical issues meeting, Sept. 6, Washington, D.C. 1996.

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nutrition and health community becomes less important and that of other sectors becomes more so. An example of this is the vitamin A sugar fortification program in Bolivia, where one of the major bottlenecks to the success of the pilot project was the system for distributing the fortified sugar. The need for private sector product marketing expertise was evident.

Some of the reasons that the private sector has not been more involved include:

- Lack of awareness about micronutrient deficiencies
- Lack of demand by consumers for fortified products or supplements
- Legislation prohibiting fortification of some foods
- Inadequate guidelines on labeling, claims and publicity
- Lack of specifications and legal framework for supplements
- Distrust of some agencies about working with commercial interests
- Conception that micronutrient problems are relevant only to the poor
- Lack of demonstrated commercial benefits/market share protection.

It is evident that there is a need for public education (such as through the media and other public relations techniques) to develop greater awareness about the prevalence and importance of micronutrient deficiencies. Additionally, showing the role that fortification has played in developed countries would also be useful. As shown with other private sector initiatives, much of the cost of research and product development will be borne by the private sector once a market for their products is seen as likely. Supplement 8, page 109, illustrates several different aspects of the private sector that could be used to enhance micronutrient intake.

3. Conclusions

a. Micronutrient Priorities

There is clear evidence (thanks to USAID-supported research) that supplementation programs can improve vitamin A status. These efforts should be supported where deficiencies exist until fortification and dietary diversity can be achieved. Because of the benefits of fortification for both vitamin A and iron status, support for these efforts should be enhanced at a country level. Promoting dietary diversity is a longer term approach that needs to be considered in comprehensive programs. How to do so effectively at a sustainable cost is, however, not yet clear.

Building on the continuing success of USAID's leadership role in reducing vitamin A deficiency throughout the world, and while not compromising its efforts in this area, the Agency should vigorously involve itself in efforts to reduce iron deficiency anemia. Relatively modest amounts of USAID funds have gone into iron interventions to date, although over 40 percent of funding approved by OMNI Research for operations research projects is focused on iron.

As stated in a recent INACG⁸ strategic plan:

"There is a pervasive sense that anemia due to iron deficiency is so widespread that it is an overwhelming problem without any solutions at hand. At the national and regional levels, inadequate information at the highest governmental levels and lack of technical support for program planners combine to conspire against the development of appropriate programs. Finally, there is no one marshaling political will and needed resources"

While MotherCare is working on anemia as one component of its activities, it has a budget of only \$2.5 million over five years for all micronutrient activities. Since the prevalence of iron deficiency anemia in women is so extensive, it makes sense for USAID to look to OMNI FS to expand its role in developing country programs in this area. A range of possible areas of intervention suggest themselves: advocacy to stimulate government support for iron interventions; development of policy options; ensuring supplies of iron/folate; developing country-specific communication materials; and, perhaps most importantly in the long run, enlisting active and creative participation of the private sector.

⁸ Flumenbaum, W. Strategic plan for the International Nutritional anemia consultative group. Jan. 8, 1996. ILSI, Washington, D.C.

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Ongoing contact between researchers, advocates, donors, the private sector and program implementers in anemia must be ensured. An advisory group should be set up to advise OMNI and other groups on how to efficiently implement iron programs. Decisions on how INACG's role could be strengthened and affirmed should be an early agenda item of the advisory group. However, unlike the OMNI Technical Advisory Group (TAG) and other TAGs used in USAID projects, this group should be more active and meet on a regular basis (e.g., at least semi-annually).

With technical guidance and core funds assured, programs to reduce anemia should be supported. These programs should address pregnant women where a high proportion of maternal deaths could be prevented by anemia reduction. They should also focus on reducing anemia in preschool children and on improvements in nutritional status which would result in decreases in childhood deaths. Such programs should focus on improvements in intake of bioavailable iron (through supplements, fortification and dietary interventions) and anti-helminthic treatment.

b. Country Program Emphasis and Monitoring

As previously suggested, the difficulty in assessing the impact of piecemeal activities raises concern about whether it is cost effective to fund small-scale efforts in many countries, rather than more intensive efforts in a few countries. The review team concludes that, to the extent possible, keeping in mind the caveats previously described (e.g., need to respond to Mission requests, even if from non-priority countries), funding should be focused on comprehensive, multidisciplinary country-level activities. Good monitoring and evaluation systems need to be put into place, and more emphasis placed on determining lessons learned so that these can be shared across programs.

Many lessons have been learned through IMPACT, OMNI FS and HKI about the importance of monitoring systems to provide the data needed by governments to improve their micronutrient programs and policies. More emphasis should be given to making certain such systems are available to governments to guide and inform their decision-making. Because of their high costs and the time needed for analyses of data, surveys should be done selectively when there is no other way to obtain the needed information. Opportunities should be taken to add questions to ongoing monitoring systems or through regularly collected national surveys, such as the DHS or surveillance systems.

An important need is to fill gaps in the data required for the development of fortification programs. A step often missing in the process of determining which food should be fortified is that of assessing which foods are most consumed by the target population. Although there is not universal agreement on this point, one way to obtain such information, at least in rough outline, could be by adding questions on food consumption to a survey or a surveillance system. Such information may be obtained relatively easily compared to the conduct of a nationwide food consumption survey. Nonetheless, emphasis should be on quick turn-around of analyses of such data and reporting back to local, regional and/or national authorities. Increasing the operations research capability to address problems noted through monitoring of programs is also a priority. (See III.D., pages 59-81, The Micronutrient Research Agenda and its Application, for further discussion on this point.)

c. The Private Sector

Enhanced involvement of the private sector in supplementation and fortification activities should be a priority. By using the private sector, many of the technical concerns that have been raised concerning fortification can be handled without USAID funding large segments of the cost. Through sales of supplements and fortified complementary foods to those who can afford them, the costs of supplying either free or subsidized supplements to sectors of the population most in need can become more feasible for governments. Additionally, the advertising of products can help create demand. An example of this is shown by the increased demand for Vitamin E supplements in the U.S. in response to information provided to the public through the press and through the health sector.

OMNI FS and ILSI in particular have already collaborated with the private sector, and these attempts should be further strengthened. OMNI should also, as it has in the past, continue working with the SUSTAIN project as yet another way to establish and strengthen working relationships in the private sector.

d. The Importance of Collaboration

The value of effective collaboration among implementers cannot be exaggerated, and good examples exist to prove the point. Field collaboration in the Philippines and Nepal has been excellent. In Bangladesh, HKI programs are implemented among no less than 35 NGOs, two GOB offices, USAID, and other donors.

But lack of collaboration has also worked to the detriment of maximizing the resources of the micronutrient portfolio. Collaboration must be strengthened

between OMNI FS, OMNI Research, HKI and JHU, as well as with other central projects (Linkages, MotherCare and BASICS) that work on health and nutrition programs. This could include joint support for programs and impact evaluations in countries of mutual interest. Case studies which highlight successful linkages between programs, such as those which connect vitamin A interventions with WHO's Integrated Management of Childhood Illness Initiative or with EPI Plus, would contribute to an increased understanding of how effective collaboration can benefit all parties. Additionally, mutual review of research projects or programmatic interventions would be useful.⁹ Joint review of program plans by researchers would help ensure high quality of technical interventions while at the same time involving researchers in programmatic efforts.

Collaboration with the Quality Assurance (QA) Project would be extremely useful; a point well proven by the effective working relationships between HKI and QA in Niger. Many of the issues that are bottlenecks to supplementation initiatives have been addressed in other health programs. The QA project (and the Rational Pharmaceutical Management Project) has well tested methodologies for addressing these issues. Also, collaboration with AED/PROFILES would enhance the advocacy capabilities of the portfolio, and could be especially useful in Africa where political and informational obstacles are likely to be significant.

Collaboration at international levels should include UNICEF, WHO, the UN subcommittee on Nutrition, the World Bank, the Micronutrient Initiative (MI) and other donors, as well as governments, the private sector, PVOs and NGOs. (See section III.B., page 33, Policy and Resource Allocation.)

e. Other Micronutrient Deficiencies

Improvements in the overall micronutrient status of young children are likely to have even greater benefits on child mortality than vitamin A or iron alone, and developing and testing this approach should be a part of future activities. The same is true for supplements for pregnant women. The cost of raw materials for a six-month supply of vitamin A, D, B₁, B₂, B₆, B₁₂, C, niacin, and zinc at levels appropriate for pregnant women is only about \$1.00, compared to \$.40 for iron/folate alone (Supplement 9, page 111). While there would be additional costs over current packaging, the total cost of a multiple vitamin-mineral

⁹ For example, the upcoming studies on the role of Vitamin A supplementation on transmission of HIV among breastfed infants should be formally reviewed by technical experts on breastfeeding within the Linkages project. This will help ensure that appropriate indicators of breastfeeding can be controlled (exclusive breastfeeding needs to be assessed accurately).

supplement is small compared to the distribution costs alone associated with delivering supplements to women, especially hard-to-reach women at high risk. The impact of multi-vitamin supplements should be tested in different settings to assess benefits for maternal and child health, especially since iron deficiency is commonly found with other micronutrient deficiencies. Additionally, there are important synergies between micronutrients and iron status. For example, both vitamin A and vitamin C intake along with iron intake improve iron status more than iron alone. A particular focus of these tests should be on the likelihood of multiple micronutrient deficiencies in refugees.

f. Dietary Diversity

Focus on increasing dietary diversity should be considered when comprehensive programs (rather than small-scale activities that have yet to be shown to be effective) can be funded to address all the inputs needed. While continued support for large-scale integrated efforts is appropriate, funding of small-scale gardening efforts is questionable until impacts can be illustrated, except as pilot projects where there is a clear intention and prospect for scaling up.

RECOMMENDATIONS

- USAID should continue to fund activities to improve Vitamin A status, but wherever possible, not solely through supplementation. Where supplements are used, programs should consider coordinating with EPI and develop micronutrient days/weeks that have been shown to be highly successful.
- Based on the success of USAID's leadership role in reducing vitamin A deficiency, it should now take the lead in reducing iron deficiency. An advisory group could be set up to advise OMNI and other USAID-funded micronutrient activities on how they can implement iron programs efficiently.
- To the extent possible, funding should be focused on support for comprehensive country-level activities. Programs that include several levels of approaches (e.g., improving delivery systems, supplies management, social marketing) should be encouraged. Drawing on OMNI, IMPACT and HKI experience, monitoring systems should be put into place so that the impact of these efforts can be assessed and lessons learned and shared. A task force or working group should be established to assess the data needs of USAID-funded micronutrient programs, and develop methods of filling gaps in data



on coverage, health impacts, behavior change, etc., either through existing or newly developed sources.

- Enhanced involvement of the private sector in supplementation and fortification activities should be a priority, as a long-term method of reducing costs and increasing coverage. Private sector leaders should be involved in national policy dialogue, informed about and consulted on legislative initiatives, and exposed to successful private sector initiatives in other countries. The private sector understands problems inherent both in food fortification technology and the production and distribution of pharmaceuticals.
- Multi-vitamin/mineral supplementation should be seriously considered. The impact of such supplements should be tested in varying settings to assess benefits for maternal and child health.
- The priority of targeting micronutrient initiatives to underserved populations should be maintained and efforts to reduce the likelihood of micronutrient deficiencies in refugees should continue.

B. POLICY AND RESOURCE ALLOCATION

1. USAID Role in International Micronutrient Policy Dialogue

Nutrition as a whole and micronutrients in particular had a relatively low profile in international health policy dialogue until given a global boost by the 1990 World Summit for Children. The Summit's final declaration, signed by heads of state from 123 countries, set a target of the year 2000 for the virtual worldwide elimination of iodine and vitamin A deficiency disorders, as well as a drastic reduction in iron deficiency anemia in women. These goals, further refined at the 1992 International Conference on Nutrition (ICN) in Rome, became a centerpiece of the Plan of Action for Nutrition which emerged from the ICN. They gave the international community the beginnings of a common framework within which to view micronutrient programs and build commitment for their implementation.

Well before other international organizations were putting micronutrients on the policy map, USAID-funded research was building the platform for the World Summit and ICN goals, by demonstrating that low-cost micronutrient inputs

offered a high return in terms of alleviating poverty and malnutrition, and thus of enhancing economic development. As will be described in detail in III. D., pages 59-68, this research, among other things:

- confirmed vitamin A's role in saving childrens' lives
- identified the impact of iron on child learning and development
- led to improvements in, and lowered costs of, food fortification and preservation technology
- demonstrated the impact of communications and social marketing on improving dietary practices.

USAID was also the earliest supporter of efforts at information exchange and consensus building on micronutrient issues within the international scientific community. It has always been a flexible supporter of ad hoc meetings on key research or policy topics. For example, OMNI has recently, on short order, convened meetings on the bioavailability of vitamin A from vegetable sources and on the immune response to vitamin A.

One of USAID's most durable and successful efforts in this regard has been through its funding (presently channeled through OMNI FS) of the International Vitamin A Consultative Group (IVACG). Since 1975, IVACG has been recognized as the world's leading consultative body on vitamin A research and on standards of practice for vitamin A supplementation, fortification and communications programs. The IVACG world conference, which is held approximately every 18 months, and IVACG publications, have become extremely influential in furthering policy dialogue and building commitment in countries grappling with micronutrient malnutrition.

Less successful has been USAID's support for a similar organization founded in the 1980s to advance dialogue and exchange on issues related to iron deficiency anemia (IDA). The International Nutritional Anemia Consultative Group (INACG) was intended to do for iron what IVACG has done for vitamin A—give it visibility, provide a forum for technical exchange, and contribute to policy dialogue. Due to the lack of vigorous leadership and a clearly-defined mission, INACG's work has lacked focus and continuity. As a result, USAID funding (also channeled through OMNI FS) has been reduced to a minimum. Efforts are

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underway, in concert with the World Bank and others, to invigorate INACG's role and purpose. If they can be pursued energetically and consistently, the review team supports these efforts, because IDA clearly needs an entity to champion its cause. The impact that IVACG has had over time demonstrates the value of such an organization in promoting good research, presenting technical issues for debate, and raising political awareness. (IVACG and its future are discussed further in III. D.4., page 72, of this report.)

The most notable multilateral effort in micronutrient advocacy currently underway is the Ottawa-based Micronutrient Initiative (MI), founded in 1992 following the "Ending Hidden Hunger" Conference in Montreal. Through a range of communications, program support and capacity-building activities, MI seeks to strengthen and accelerate international commitment to achievement of the micronutrient goals of the World Summit for Children. Its goal is to convince national leaders of the importance of increasing budgetary support for micronutrient programs, and assist them in meeting their technical and resource needs.

USAID was not an early supporter of the Micronutrient Initiative, which is funded by Canadian bilaterals, UNICEF, UNDP and the World Bank. But it has recently become a member of the MI steering committee, which is welcome evidence of increased involvement. As an acknowledged leader in the field, USAID should not miss such opportunities, for several reasons:

- There is much to be gained in coordinating international micronutrient efforts among key players, not least the chance it affords the Agency to explore opportunities to leverage its own scarce financial resources through collaboration with other initiatives.
- USAID brings to the table vast technical resources, not to mention strong contacts with the U.S. private sector. Where these can be put to use in targeted support for the micronutrient programs of others, talents and resources are maximized.
- MI presents opportunities for USAID to share ideas, opportunities and results with, in particular, UNICEF and the World Bank. Both are major players in international efforts to combat micronutrient malnutrition, yet the review team felt that each lacked a comfortable familiarity with the others' program priorities and activities. Better, more regular interagency information

exchange can only enhance strategic planning and strengthen international partnerships.

Another body that plays an important role in the international micronutrient policy dialogue is the Sub-Committee on Nutrition (SCN) of the Administrative Committee on Coordination (ACC) of the United Nations. The SCN has representatives from all relevant multi- and bilateral organizations with interests in nutrition and micronutrients, including USAID, and serves as a focal point within the UN for interchange of information on program and policy matters. Continued participation in and support of the SCN by USAID will ensure access to a forum which is especially useful in sharing ideas and opportunities at a time when members all find themselves in a situation of diminished financial resources.

2. USAID's Impact on National Policy Development

Through readings, interviews and site visits, the portfolio review team observed that the impact of USAID-funded micronutrient interventions on national policy development and resource allocation varies widely by region, and is heavily dependent on local cultural and socio-economic variables. Also of critical importance is the investment, both in financial and level of commitment terms, of the local USAID Mission, a subject which is discussed below. Broadly speaking, the policy impact of USAID support is most readily observable in countries of Asia, moderately apparent in Latin America, and relatively absent in Africa. A few profiles will illustrate the wide range of possible results and show that when opportunity, vision, and resources are combined, permanent change can result.

- In the Philippines, the October 1996 promulgation by the University of the Philippines of an official "Endorsement of Flour Fortification with Vitamin A for the Elimination of Vitamin A Deficiency" was only the most recent evidence of a national policy climate that has become increasingly friendly to micronutrient initiatives. Much of that evolution can be traced directly to USAID-funded interventions, first through Cooperative Agreements with HKI, and more recently adding the participation of OMNI FS.

For a decade HKI, through its VITEX (for Vitamin A Supplementation and Nutrition Education Expansion) Project and other training, research and communications initiatives, has closely supported the Department of Health's (DOH) national micronutrient program. Baseline research carried out under VITEX in three target provinces documented the link between vitamin A consumption and decreased rates of xerophthalmia. A pilot vitamin A capsule

distribution project in these provinces provided the DOH with the technical and logistical justification for instituting and allocating resources for a national capsule distribution policy, starting in 1993. Distribution occurs semi-annually, during National Immunization Day and again on a newly-created National Micronutrient Day (Arawng Sangkap Pinoy, or ASAP). Coverage of children 1 to 6 years old has approached 90%. Coincident distribution of iodized oil capsules has reached 81% of women 15 to 40 years old.

HKI has also served in other ways as partner and principle international technical advisor to the DOH's national micronutrient program. It has designed advocacy materials and training guides, trained micronutrient workers from more than 50 NGOs, and organized national meetings on community-based micronutrient interventions. It has worked especially hard to make local government executives believers in micronutrients. In large measure because of these efforts, by 1993 the GOP's budgetary allocation for micronutrient activities, primarily vitamin A and iodine supplementation, was over \$3.2 million.

OMNI FS has been represented in the Philippines since late 1995, and has made itself an effective complement to HKI by playing a facilitating and coordinating role in furtherance of micronutrient policy dialogue. It worked with the DOH to accelerate development of its National Micronutrient Operational Plan. It convened a series of Public-Private Sector Dialogues, providing the GOP, NGOs and food industry representatives a venue for discussing fortification, supplementation and dietary diversification issues. It coordinated the Sangkap Pinoy Seal program, which awards the ASAP seal to processed food products judged to be nutritionally beneficial. And it organized GOP-industry conferences which have led to developments such as the aforementioned endorsement of flour fortification.

Together, HKI and OMNI FS have provided the Philippine Government with technical, organizational and financial resources that have advanced the national micronutrient agenda faster than if they had not been involved. (See section III.E., Portfolio Management, page 82, for further discussion of this relationship.) Keys have been local presence, continuity over time, and flexibility in responding to government needs and priorities. In terms of influencing policy development and resource allocation positively, the Philippines stands as a solid success.

- Continuity and flexibility have not been characteristics of USAID-funded micronutrient activities in El Salvador, with the result that they have yet to realize significant impact. Since 1994, all of USAID's support to micronutrient initiatives in El Salvador has been channeled through OMNI FS,

which was instrumental in helping the MOH incorporate micronutrients in its National Health Plan. Based on its own situation analysis, OMNI FS then decided to focus its efforts on quality assurance, improving supplementation services, community education, and NGOs. All of this had the purpose of strengthening the GOES' stated commitment to reducing micronutrient malnutrition, and to committing its own budgetary resources to the task.

A series of consultant and staff visits resulted in the initiation of several specific activities. But the absence of an OMNI representative in El Salvador has caused them to be pursued in a stop-start, piecemeal fashion. For example, an OMNI-supported survey of Salvadoran NGOs determined that there were many who could be effective collaborators in the Ministry's plan to improve and expand vitamin A and iron supplementation programs. It is also clear that the Ministry would like their assistance. But plans to formalize the NGOs' role have not been coordinated and are presently stalled. In another instance, OMNI consultants conducted qualitative research to determine what messages and materials were most effective in transmitting nutritional messages. But production of the materials and training in their use has not ensued.

The effect of this uncoordinated approach has been, so far, to waste important opportunities to support Salvadoran micronutrient programs and leverage Salvadoran resources in the process. It has also left host country counterparts uncertain as to when particular initiatives will be brought to closure, and by whom. Clearly this is a program management problem, one which is exacerbated by the fact that USAID funding for OMNI FS is allocated on an annual basis, and often in unpredictable amounts, making planning difficult at best. But it is also a policy issue in the sense that continuity is critical to the careful nurturing of policy dialogue and support of policy decisions. No program should be contemplated in a country, by OMNI or any other contractor, unless it can ensure such continuity through regular, on-the-ground coordination.

- One of the most impressive examples of the use of USAID funds in supporting policy development and taking micronutrient actions to scale can be found in the National Vitamin A Program of Nepal. Managed and funded through HKI as an OMNI subcontractor, with commodities provided by UNICEF, the program is making possible the systematic expansion of vitamin A supplementation to 32 of the most heavily populated districts in Nepal. (The country has 75 districts overall, but many not covered are very sparsely populated.)

Working closely with local NGOs and the government, HKI initiates vitamin A capsule distribution in two districts at a time, training Female Community Health Volunteers (FCHVs) as distributor-educators, developing an information campaign and establishing logistics systems. Once district programs are well launched, HKI turns their management, funding and supervision permanently over to the Government of Nepal. The program is on track to be operational in all 32 priority districts by June 1997. Coverage rates regularly exceed 80% of children 6 to 60 months of age, and in some cases have gone above 90%.

An interesting development within the Nepal program was the decision of NGOs closely involved with micronutrient activities to join together to form their own non-profit consulting organization. It is providing technical and advisory assistance to the GON, as it assumes responsibility for an ever-expanding portion of the national program. Since personnel of these NGOs were in many cases trained under HKI auspices, this illustrates another variation on the potential long-term policy and program impacts that USAID funding can achieve.

- Other countries where USAID-funded interventions, primarily through OMNI but also previously through VITAL, have helped lead to the incorporation of micronutrients in national health plans include Ecuador, Nicaragua, Indonesia, Eritrea, and Zambia. The success of home gardening projects in Bangladesh led to the formal espousal of home gardening by the Ministry of Agriculture. Surveys are now being completed that will likely lead to important policy decisions in Honduras and Morocco. That most of this has occurred in the last three to four years can in large part be ascribed to the fact that only in the early 1990s did worldwide acceptance of the potential mortality impacts of vitamin A begin to emerge, thanks in large part to USAID-funded research. This in turn gave greater visibility to other micronutrients and their benefits to health. But this is also an indication that opportunities for policy breakthroughs in other countries should now increase rapidly.

As the PROFILES indicate, the policy and resource allocation impacts of USAID-supported micronutrient programs vary widely and are often difficult to quantify. They point up the need to constantly consider policy applications at all stages of the development of intervention strategies. What works in one country may be inapplicable in another. The constants are a need for flexibility and continuity in planning and in providing technical and financial assistance. It is also critical that USAID Missions buy in, in the philosophical as well as the financial sense, to the micronutrient message, as discussed below.

3. USAID Missions' Role in Micronutrient Policy Promotion

a. Obstacles to Mission Support

The review team was concerned that only a small percentage of the USAID Missions with which it had contact, whether through site visits, telephone communications, or third party reports, seemed fully invested in the micronutrient cause. Even in countries where USAID funding has played an effective role in the furtherance of the battle against micronutrient malnutrition, one often sensed only lukewarm support on the part of Mission personnel. In Africa, in particular, there is consensus that micronutrients have found a secure place in the planning of only a few Missions, despite the existence of need, opportunity and funding.

Although this situation is often difficult to understand, given the need for, and the relative cost effectiveness of, micronutrient actions, a few explanations are suggested:

- People tend to “go with what they know.” Based on years of experience and mention of political and financial support, the health-related programs with which Mission personnel are most familiar are population/family planning and HIV/AIDS. Many Mission health officers come from a population background and are most committed to family planning goals and philosophy, often linked to AIDS and STD prevention. In most Missions there is little or no understanding of the importance and role of micronutrients.
- Faced with the complexities of the Agency's re-engineering effort and the requirement to develop strategic objectives within a new, results-oriented framework, Missions may tend to focus on subject areas with which they are familiar rather than contemplate the additional complexity of an unfamiliar program.
- Micronutrients have not as yet been effectively “sold” to Missions that already have many priorities. The approaches that have been used have tended to be generic rather than being tailored to the unique realities of particular regions. As will be discussed in the following section on Communications (III.C., pages 43-59), there is a need to simplify and strengthen the messages used to promote micronutrients as a viable, cost-effective intervention. As just one example, use of the AED/PROFILES policy project could yield fruitful results in terms of Mission motivation.

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- In the eyes of some Mission personnel, micronutrient “true believers,” usually PVO representatives, come on too strong without building a proper case for micronutrients as a viable element of child survival. This can ensure a less than sympathetic hearing from Mission HPN personnel.

Better messages, more perceptive marketing, and more effective dissemination of results and findings from successful projects are all needed to help micronutrient interventions become better accepted as an element of USAID Mission program policies and strategic objectives. To this can be added the need to enlist more vigorous support for micronutrient strategies on the part of Regional Bureaus. Separately and together, these will enhance the opportunities for interventions to impact policy dialogue in more countries.

b. Africa Mission Support for Micronutrient Policy Initiatives

OMNI FS has received \$1.2 million from USAID under the requirements contract for salt iodization work in Eritrea. In Zambia, OMNI FS is spearheading an initiative to integrate micronutrients with growth monitoring, breastfeeding, EPI and other interventions in one package which if successful could have significant implications for health program policy and planning in other countries. HKI has had modest success with a vitamin A supplementation project in Niger. However, in general, reasons suggested above for limited USAID Mission enthusiasm towards micronutrients are particularly applicable in Africa. Although micronutrient malnutrition levels on the continent are some of the highest in the world, initiatives to combat them have been scattered and embryonic.

At the same time, however, the African situation presents interesting opportunities. Because so little has been done with micronutrient programming, Missions have a chance to draw on lessons learned elsewhere. A greater emphasis on research in the Africa region could energize the policy/program agenda, much as it has in Asia. With child survival money relatively plentiful, there are indications that Missions would be interested in using some of those funds for micronutrient projects, particularly in integrated packages. Or, given the African propensity for health-related campaigns, vitamin A messages and supplementation initiatives might be linked with national EPI programs, as has been done successfully in the Philippines, Bangladesh and Indonesia.

Two Africa regional USAID programs, the Greater Horn Initiative and the Initiative for Southern Africa, offer opportunities to draw on micronutrient experiences elsewhere in a way that is not threatening to any individual country.

For example, the USAID Regional Center for Southern Africa in Gaborone will be holding a meeting in early 1997 for the purpose of making choices that will affect program policy in the region for years to come. Micronutrients will be on the agenda as one of several program options.

A similar consortium of Central American countries (El Salvador, Guatemala, Honduras, Nicaragua) has dealt with the full range of micronutrient program issues over time. It has been able to do such things as facilitate countries' efforts to establish fortification standards, develop supplementation models, and encourage dietary diversification. Experts from this consortium could be of great assistance to the Gaborone meeting, asking questions and suggesting approaches which could avoid problems already confronted in Central America. In the process, they would help USAID and Southern African health ministries make decisions on which micronutrient interventions make the most sense for the region.

RECOMMENDATIONS

- USAID should spearhead and accelerate efforts to reinvigorate INACG as a viable consultative group for iron, guided by the successful IVACG model.
- USAID should maximize its support for and participation in the UN Sub-Committee on Nutrition (SCN) and the Micronutrient Initiative, so as to continue to build international awareness of micronutrient malnutrition, prompt full exchange of ideas and priorities, and develop creative partnerships among international organizations which will among other things open up opportunities to leverage each others' funds.
- No national field support program (as distinct from individual research projects) should go forward without the principle implementer having a regular presence on the ground to ensure the flexibility and continuity necessary to fruitful policy dialogue and effective policy development.
- USAID/Washington should be more strategic and message-savvy in "selling" its Missions, especially African Missions, on the appropriateness and cost effectiveness of micronutrient programming so they in turn can feel confident in proposing policy and program options to host governments. More inter-regional sharing of expertise and lessons learned should be encouraged

starting with the February, 1997 Southern African regional meeting in Gaborone.

C. MICRONUTRIENT COMMUNICATIONS

1. Introduction

The USAID micronutrient portfolio supports a variety of activities in the communications arena, which can be categorized into two general areas:

- (1) **project communications**-includes social marketing, behavior change and IEC (information, education and communication) activities; and
- (2) **information dissemination**--development, production and distribution of informational materials.

The scope of work for the portfolio review focuses on **project communications**. However, the review team also covers information dissemination activities in this review. This introduction touches on both communication categories and is followed by separate discussions of each.

USAID's micronutrient communication strategies contribute to SO3 and its Intermediate Results through both communication categories, including:

- information dissemination to build knowledge, awareness, commitment and policy, and to stimulate demand for interventions (IR 3.1 and 3.2)
- nutrition education programs and behavior change interventions targeted at public and private sector agencies and NGOs, health care providers and at-risk populations (IR 3.3)
- research to develop and evaluate new communication approaches and the effectiveness of existing programs (IR 3.1 and 3.3)
- training in communication and behavior change theory and practices for those people working to design and develop intervention programs (IR 3.4).

The portfolio projects under review have funded project communication and information dissemination activities through Vitamin A for Health (VITA) and OMNI. VITA has focused its communication activities more on project communications whereas OMNI-FS has to date placed a greater emphasis on information dissemination. This may be due in part to the relatively modest inventory of mature projects which have been developed to incorporate communication activities. However, with two years remaining in the contract, OMNI-FS has an opportunity to break new ground in project communications, particularly in the areas of food fortification and the testing and documenting of behavior change approaches to dietary diversification and supplementation. New country activities have been/are being initiated that will require increased input from project communication specialists for success, bringing greater balance to overall OMNI-FS communication activities and enhancing coverage levels achieved by OMNI as a whole.

2. Project Communications

a. Lessons Learned

USAID has two decades of experience developing and adapting strategies to change micronutrient-related attitudes and behavior. Two USAID-funded booklets, one published by IVACG in 1992, the other by OMNI/AED in 1996, document lessons learned from these activities. They indicate a solid understanding of the use of communications techniques to promote supplementation and dietary diversification. USAID has less experience and consequently less knowledge regarding communications to support food fortification interventions.

Some of the important lessons learned come from Indonesia where USAID funded the ROVITA, SOMATA and SOMAVITA I and II Projects, which have all utilized social marketing and behavior change principles. These projects have had an impact beyond their local level as lessons have been applied to new and/or scaled up programs. For example:

- Social marketing approaches that include behavior change objectives are effective in increasing consumption of vitamin A-rich foods. This was confirmed by the HKI project in Niger which promoted dark green leafy vegetables (DGLVs) and liver through multi-media, using locally-performed dramas.

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- Decentralization of planning for communication campaigns increases local innovation, acceptance and sustainability of national-scale interventions. In Nepal, individual districts develop their own vitamin A capsule distribution campaigns as part of the growing and highly successful national supplementation program.

 - Standardized criteria for selection of foods to promote for dietary diversification can be determined at the national level but decisions on specific foods and promotional strategies should be made locally. This lesson was applied in HKI's Bangladesh project which promotes production of different vitamin A-rich foods according to what is agriculturally and socially appropriate in different districts. It also illustrates the difficulty of taking food-based interventions to scale. Behavior change principles that guide model projects remain constant, but program content can vary widely from district to district.

 - Interpersonal communications (IPC) are critical to micronutrient programs, especially with marginalized populations such as in concentrated urban areas where people with different cultures/languages live in close proximity. Mass media messages are difficult to target to such populations. The Bangladesh Homegardening Project (NGNESP) is expanding its program to urban slums, relying heavily on IPC methods to reach newcomers.

 - Social marketing campaigns can dramatically increase vitamin A capsule coverage on a national scale. This is particularly true when they are conducted in conjunction with other health interventions, such as EPI and ORT education or National Immunization Day (NID) events. This lesson has been applied in Bolivia, Bangladesh, the Philippines and other countries.

The role that communications should play in promoting consumption of fortified food is only recently becoming understood. OMNI-FS is funding model projects in such places as Bolivia, El Salvador, the Philippines and Eritrea. While lessons learned have yet to be documented, they are already becoming clear, to wit:

- The private sector should be engaged in market research and product identification/design activities. The Sangkap Pinoy Seal Program (SPSP) in the Philippines stimulated private sector cooperation in producing and marketing fortified foods through use of a special "seal" that certifies

Department of Health endorsement of a product. The program is generating strong enthusiasm in the food industry.

- Although national mandates to fortify foods exist in many countries, private sector compliance often is weak. The El Salvadoran iodized salt project is a good example of a successful universal fortification effort that has been almost entirely government-driven.
- Public-private partnerships need careful nurturing. The OMNI-FS VITAZUCAR sugar fortification project in Bolivia has relied exclusively upon the private sector to develop the project's pilot phase. Expansion will test the ability to bring together public health and private industry concerns in addressing population segments at risk for VAD.

The micronutrient portfolio has funded various meetings on academic and operations research topics. There has not been similar support for micronutrient programs to develop a shared understanding of project communications issues. OMNI is the ideal mechanism to establish a forum for exchange of communication technologies, tools and lessons among practitioners from around the world. For example, the vitamin A capsule (VAC) supplementation program in Nepal has created a useful tool for record keeping that is utilized by its volunteer health workers, which could be beneficial to the Bolivian VAC program managers who are experiencing difficulties with their record-keeping system. A forum that offered nutrition communicators and program planners the opportunity for dialogue and sharing would be a great benefit to the entire micronutrient portfolio.

Meanwhile, OMNI should continue to document its own stories as lessons for others. Case studies from the various stages and processes of current social marketing and behavior change interventions implemented by OMNI-FS—VITAZUCAR and Sangkap Pinoy being two prime examples—should be produced and disseminated on an ongoing basis in the interest of advancing the state-of-the-art of the field.

A trend toward decentralization of health services is taking place across the globe, which presents new challenges for many aspects of micronutrient interventions, including communications. OMNI is beginning to direct attention to the needs of these newly changing systems. In the Philippines, OMNI is funding HKI to create a model for delivering technical assistance in nutrition to regional- and district-level health decision makers. The challenge for health communicators is how to

translate the value of a successful national program into meaningful and affordable terms for local government. This issue will be particularly salient for VAC programs when local governments assume the cost of the capsules and the social marketing campaigns.

b. Social Marketing for VAC Supplementation

Lacking the financial inputs that EPI and family planning programs have enjoyed, social marketing VAC campaigns have, nevertheless, been successful in achieving high levels of coverage because:

- they have built on lessons learned from campaign models for EPI, contraception, and ORT
- they have combined efforts with EPI campaigns
- the target audience has experienced a positive impact from vitamin A supplementation at low personal cost
- campaigns have been centrally funded and coordinated.

USAID-supported vitamin A capsule distribution programs have been highly successful in lowering the rate of micronutrient deficiencies in many countries. They have utilized mass media campaigns to generate awareness and to motivate mothers to bring their children to health posts twice yearly for VAC. In addition, IPC methods to promote supplementation are employed in some VAC programs. Campaigns have been structured so that there is relatively little "cost" to participating mothers, which accounts in good part for their success in reducing VAD.

A social marketing approach that combines vitamin A capsule distribution with immunizations and other public health campaigns has been successfully adapted in many countries with USAID funding. VAC campaigns in Indonesia, Nepal, Bolivia and Bangladesh all are combined with NID campaigns once per year. For the second round of capsule distribution they have created some form of an independent "micronutrient day."

c. Communication For Iron Supplementation

Iron supplementation relies on more complex behavior change approaches than VAC due to the nature of the product being promoted. Vitamin A capsules are administered to target populations twice yearly, whereas iron tablets must be taken on a daily or weekly basis. Iron project communicators are thus challenged by more variables to success: access to dependable iron tablet supply; understanding of storage requirements; need for high degree of motivation; understanding and consumption of proper doses.

Research is needed to determine the best of these communications approaches. OMNI-FS's work in Indonesia (The Girls Project and Localvita), and projects with tea workers and factory workers in Sri Lanka and Bangladesh, should be evaluated for the effectiveness of their delivery systems and behavior change approaches that control some of the challenges to individual compliance. These early projects potentially will influence the direction of IDA interventions in the same way that initial VAC social marketing activities in Indonesia established models for other countries to adapt.

d. Social Marketing for Dietary Diversification

Communications for dietary diversification rely heavily on IPC and behavior change approaches, often through social marketing. USAID has funded successful social marketing projects to promote increased consumption of DGLVs and other vitamin A-rich foods (eggs, liver, mangoes). It also has funded increased production of such foods in Bangladesh, Niger and Nepal.

The greatest challenges for project communicators in dietary diversification are sustainability and expansion. Experience in Indonesia and the Philippines shows that these types of interventions take time (more than one year of actual program implementation) for real change to take hold. Behavioral decay or substitution will occur if new behavioral patterns are not maintained once established. Maintenance of programming efforts over time establishes new societal norms and expectations.

In general, the long-term nature of dietary diversification projects has not meshed well with USAID's traditional funding mechanisms, with their relatively short horizons. Few social marketing projects which promote consumption of diverse foods have yet had the time and funding to scale up to a significant level. (One notable exception is the VITEX "Weaning Moments" project in the Philippines,

which expanded to fourteen additional provinces beyond the original three with the assistance of UNICEF.) The use of evaluation mechanisms that monitor progress towards behavioral objectives should be tied to additional funding of this area of activity.

Additionally, alternative approaches to nutrition education that include micronutrients and dietary diversification themes should be expanded into the wider context of primary and secondary schools as in the OMNI-FS GIRLS Project.

e. Communications for Food Fortification

As noted above, USAID has little experience in the promotion of fortified foods, but OMNI-FS has begun applying results from OMNI Research studies and existing knowledge from the food and pharmaceutical industries to country programs. It should now place stronger emphasis on developing a leadership role in communications for fortification interventions.

By maintaining a consumer focus, food fortification programs can tap the expertise of the private sector as they develop, test, package and market their foods. OMNI-FS should focus on developing approaches to reaching population segments that are not normally targeted by the food industry due to socioeconomic factors. Health practitioners may act from different motives than a private sector corporation, but the two can find common ground from which both will benefit. The PAMM forum on public/private sector cooperation on food fortification in Ottawa in 1995 was evidence of growing possibilities.

The SPSP also illustrates the point. The Department of Health launched the program without audience research on design of the program logo and seal. Preliminary monitoring uncovered problems with the logo design that could have a detrimental effect on the impact of the program. Two food manufacturers offered to assist the DOH in the redesign, testing and production of a new logo for the program. Hence, the SPSP has the opportunity to blend lessons from food marketing experts into the context of a public health intervention.

3. The Contribution of Contraceptive Social Marketing to Marketing of Micronutrients

There are lessons to be learned from the social marketing of contraceptives (CSM) and oral rehydration solution (ORS) that can be considered in the social marketing

of micronutrients. This is especially true for the marketing of supplements and fortified foods, but may also be true for increasing dietary diversity.

CSM was developed in response to the need to increase knowledge about condoms, oral contraceptives, or ORS, to increase their availability (outside of clinics and health centers), and to increase demand for their use. In many cases the products themselves were subsidized so that consumer costs were less than actual product costs.

The parallels to the potential for marketing iron/folate supplements or prenatal vitamin/mineral supplements are clear. Social marketing could be used to increase the knowledge of pregnant women and their families of the need for iron/folate or prenatal vitamins during pregnancy. One of the major constraints to use of iron/folate is lack of supplies at health centers. Another is that women in developing countries often do not make the monthly prenatal visits needed to pick up supplies. Increasing availability of supplements through local distribution networks addresses these problems. Since another problem with the use of supplements is often compliance, making the use of iron/folate desirable helps increase demand.

Similar profiles for the marketing of fortified staples, fortified complementary foods, iron tonics or multiple vitamin/mineral supplements for children could be tested. Convincing the food industry to market their products because of their micronutrient content (as done by citrus cooperatives in the U.S.) is another approach that should be tried. Some initial experience is being acquired through OMNI FS, OMNI Research and HKI. These activities should be expanded, especially in collaboration with other USAID projects (Linkages, MotherCare, BASICS).

4. The Role of Communication Practitioners

Communication activities are an essential component of health interventions, often proving to be the glue that holds an intervention together. All micronutrient interventions require some form of communication support, such as IEC to build awareness and stimulate demand for services. Communication professionals need to be included with other specialists from the outset in discussions of intervention strategies.

From the outset, one of OMNI's chief objectives has been to translate results of applied micronutrient research into programs of action. To support this and its other communications initiatives, OMNI FS should reconvene and support regular

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meetings of its Communications Working Group with the clear objective of ensuring more effective provision of technical assistance to country programs from their inception. OMNI FS should make better use of those of its subcontractors with technical expertise in communication and social marketing. Maintaining a vigorous, interactive Working Group will help make this possible. One issue that this group might consider is how changes in the portfolio objectives affect the strategies of communicators (for example, a shift in program emphasis from clinical to marginal VAD).

a. Building Communications Capacity

Training in communication and behavior change strategies and skills needs greater emphasis within the USAID micronutrient portfolio. Although many projects identify capacity building as part of their goals and workplan, it often gets lower priority status as the need for “getting the work done” takes precedence. Teaching the range of skills necessary to the design and implement a comprehensive communication strategy is a complex process, one that requires more than a short workshop. The G/PHN/HN Office should actively promote the development of training resources in the communication arena. Training programs should emphasize application of skills over time and the interchange of ideas and experience from programs within different regions of the world. Considering both budget constraints and the importance of good communications to the success of an intervention, it is cost effective to ensure that communications research and planning are managed and conducted by people with the capacity to do it well the first time.

Some training in communications and behavior change has been funded through OMNI, as well as groups such as PAMM, Peace Corps, HKI and The Manoff Group. Usually, however, these activities have not been part of a cohesive strategy to address the needs of micronutrient programs in developing countries for communication professionals. One initiative that was able to focus effectively on this need was a joint effort of HKI and the International Eye Foundation in Guatemala. The goal of the “Unidad Pro Vitamina A” was to strengthen the capacity of the IEF to develop training programs for Guatemala and the Central American Region and to disseminate vitamin A and nutrition education materials. The project established a Training and Resource Center for Vitamin A and Nutrition Education located in Guatemala. The impact of the Unidad’s training on the region was observed in El Salvador when several of its trainees applied their communication research skills to a new project. The “Unidad,” although a small project, could serve as inspiration for training programs that address health communications and technologies on a regional basis.

A challenge that has faced the micronutrient portfolio has been to convince USAID Missions of the importance of training. The trend towards decentralization that is occurring throughout the world makes building local capacity even more important. OMNI-FS's work with HKI in the Philippines, supporting the development of a model of TA in a decentralized system, is further evidence to underline this need.

5. Cost of Behavior Change Interventions/IPC

The micronutrient portfolio does not have sufficient information on the costs of the communication aspects of behavior change interventions. Certain costs can be determined more or less easily, such as those for a training seminar or for VAC campaign banners and radio spots. However, behavior change interventions involve more than the fixed costs of identifiable commodities or services. These less tangible costs complicate financial analyses and are often ignored altogether.

For example, what monetary value does one place on the time of a volunteer village health worker who finally convinces a mother to take her child to the health center to receive a vitamin A capsule? In many cases, this volunteer is the essential link in the service delivery chain. The VITEX project in the Philippines produced data that show the important role of volunteer health workers in achieving change. Its weaning foods project found a significant impact on the success of the program when home counseling by a volunteer health worker was added to a mix of other communication methods. The person-to-person contact about micronutrient-rich weaning foods with mothers was linked to a significant reduction in the prevalence of underweight preschool children.

Although the VITEX project studied the contribution of the various channels of communication to its impact, it did not determine costs. Replication costs of the project would be difficult to determine because the important "cost" of the volunteer has not been valued and quantified.

Behavior change strategies to alter habitual practices (infant feeding practices, developing home gardens) tend to rely more on interpersonal communication than print and mass media. This channel may be more expensive in the short term, but more cost effective in the long run in terms of sustainable impact. For example, in Bangladesh, the cost of developing a home garden during the pilot project phase was \$45 per family garden. Now the program has expanded, under HKI, to 300,000 families (1.2 million people), and the cost to establish a new garden is \$8 over three years, at which time the garden is considered to be self-sustaining without additional project input. HKI has determined that most of that cost is in



interpersonal communication and training. (See Box 4 on sustainability of the Bangladesh home gardening intervention, pg 55.)

USAID, through OMNI Field Support and OMNI Research, should place increased emphasis on developing approaches to evaluate the cost efficiencies of communications for behavior change interventions. OMNI has a project to evaluate the cost effectiveness of various intervention strategies, but should add emphasis to the behavior change elements of the mix.

a. Evaluating Impact

Very little has been done to evaluate the impact of behavior change communication interventions on the nutritional status of the target audience. Because these interventions are usually defined as long-term strategies with a large communications component, it is increasingly important to study their impact as part of determining their efficiency prior to scaling up.

USAID should place a priority on funding such evaluations, especially given the need under re-engineering for accountability and results. In Indonesia, USAID did not fund this type of research on a dietary diversification program, for which they sponsored the original intervention. Other donor agencies were enthusiastic about the potential of the project, continued its funding and in addition supported impact research. That research is now delivering data that demonstrates a positive biological impact linked to a specific social marketing campaign intervention. USAID deserves credit for supporting the project that led to the proven impact, but will not receive headline billing. On the other hand, funding to conduct research on the impact of the HKI/Bangladesh NGNESP home gardening project recently was approved. USAID micronutrient portfolio funds will support an evaluation of the project by ICDDR,B.

6. Sustainability

National and local governments, NGOs and the private sector, have absorbed costs of communication activities to varying degrees, depending on the nature of the intervention, budgetary realities and the political context. The ease of shifting responsibility for communication activities depends in large measure on the perceived strength of the intervention and the extent to which the capacity to assume the responsibility has been cultivated within the national and/or local partner organization.

In the Philippines, the national government has borne the costs and responsibility for its VAC social marketing program, but is now shifting both to local departments of health under its decentralized health system. The review team noted that volunteer health workers and midwives there now administer VAC to the target population during their regular monthly rounds in their catchment areas, eliminating the need for mothers to bring their children to local health posts for VAC campaign events. This success can be attributed to careful training, monitoring and motivation of health workers who participate in the program. The cost of communication activities in support of VAC social marketing will diminish over time as VAC distribution becomes integrated into standard service delivery protocols.

In Nepal, responsibility for communication activities in support of the VAC supplementation program, and their costs, are being phased over to the national government, while HKI continues to monitor the program for impact and quality. In Bolivia, donor agencies (USAID/OMNI and UNICEF) and a private sugar mill are working together to fund and manage social marketing of fortified sugar. The government will not consider legislation that would mandate sugar fortification on the part of the private sector until an evaluation of the impact is completed.

The strength, relevance, and efficiency of a micronutrient intervention with a behavior change focus are all factors that contribute to its sustainability over the long-term. Some of the reasons that the HKI/Bangladesh Homegardening Project (NGNESP) may be a sustainable model for a behavior change project are illustrated in Box 4, "Sustainability—a Case Study".

7. Information Dissemination

a. Activities to Date

Information dissemination activities of the portfolio have been concentrated under the OMNI project in both its field support and research programs. They address the Intermediate Results of SO 3 through promotion, advocacy and technical information dissemination regarding micronutrients. This translates into activities that:

- promote the OMNI project within the USAID global system
- disseminate information generated by OMNI and its predecessor projects about current programs of research and service delivery

Box 4

Sustainability—a Case Study

The USAID/HKI NGNESP Homegardening Project in Bangladesh is an important model of a sustainable communication/behavior change intervention. The most salient aspects of this model are that:

- ▶ **It was developed from a population based assessment of the problem**, which found that access to vitamin A-rich foods in homes was limited.
- ▶ **HKI staff utilized indigenous knowledge about plants and gardening as its starting point** for developing a program that now promotes a wide variety of vegetables and fruits that can be grown throughout the year.
- ▶ **It has created partners.** HKI works hand-in-hand with agriculture and health professionals (researchers, policy makers and practitioners) to manage the NGNESP. Early assessments indicated that access to appropriate, high-quality varieties of vegetable seeds would be important to project success. HKI has worked closely with the Asian Vegetable Research and Development Center (AVRDC) to develop and test seeds that were locally viable and culturally acceptable as well as rich in vitamin A—keeping in mind the public health goal of this agriculturally-based project.
- ▶ **It engenders commitment from each of its partners and target audience families from the outset.** The project empowers participants at all levels, while at the same time requiring their active participation. For example, HKI provides training and ongoing TA in the field to its partner NGOs who employ agricultural extension agents. However, HKI does not fund transportation nor per diem for the training meetings. HKI ensures access to seeds and technology for the extension workers in the field but does not fund the purchase of the land nor the seeds for the demonstration nurseries that the NGOs develop in their target regions.
- ▶ **The model is flexible in its response to the home gardeners'/village nursery workers' requests for assistance** regarding a variety of plants. It does not limit the parameters of agricultural TA exclusively to vitamin A-rich foods, thereby meeting a greater set of the farm families' needs for food security. For example, many families expressed a desire to grow fuel timber. HKI responded by providing some TA in this area, integrated with the TA for producing DGLVs and vitamin A-rich fruits. By responding flexibly, HKI gained credibility and probably achieved greater impact towards its core goal of sustaining improved nutritional status.
- ▶ **It has become more efficient as the project has gone to scale.** HKI estimates that the cost of developing a NGNESP home garden is one fifth the cost during the pilot phase.

- strengthen existing communication networks within the health, nutrition and micronutrient fields, including academic and professional organizations
- support OMNI country programs in their need to create and produce materials and develop strategic information dissemination plans
- support the work of IVACG and INACG (discussed more thoroughly in the sections on policy [pgs. 33-42] and research [pgs. 59-81] of this report).

The major activity of the communication staff at OMNI FS has been to disseminate information about OMNI and its work on a global basis to USAID and to public and private sector organizations and research institutions involved with micronutrients.

OMNI has developed a set of standard publication formats, some of which are produced regularly, others on an as-needed basis. Regular publications are targeted primarily at international agency and government policy makers, program managers and NGOs. Dissemination of technical information is directed to technical personnel of universities, research organizations, and government and PVO programs. Technical reports on specific topics are produced when appropriate and responses to technical questions are generated upon request. Specific requests for assistance in the development of materials on central and country program activities are met as well. A series of "lessons learned" reports is expected to be coordinated and produced during the last year of the OMNI project.

A secondary activity centers on breaking down longstanding barriers to access to information in the developing world. Many of these barriers are infrastructural and can be addressed through electronic media technologies, such as information network systems. OMNI is developing mechanisms to disseminate its technical information through pre-existing international and regional information networks and to support the linkages between these networks and OMNI's program partners.

OMNI materials are printed and distributed by mail and/or formatted and produced for dissemination by e-mail and OMNI's worldwide web page. From March to November, 1996, OMNI distributed 5,700 copies of informational materials, which in turn generated numerous additional requests. There are currently an average of 30 "hits" per day on OMNI's web page.

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b. Areas for Improvement/Reinforcement/Expansion

Despite a high level of activity, OMNI FS's priorities for information dissemination and project communications have not been clearly delineated. The review team urges OMNI to conduct a review of its communication activities with the goal of clarifying their purpose in both areas and developing a strategy for best serving project interests during its remaining two years.

One recommendation would be to evaluate the possibility of separating work into clearly-delineated project communications and dissemination activities, including specific workplans and budgets. This should result in better focused, higher quality work conducted in each area. The team believes that both are equally important to the project and portfolio, but serve separate purposes and require different skills.

With particular reference to information dissemination, the team urges an emphasis on mechanisms to reach the consumer public via mass media in countries where OMNI is active. The objective would be to generate consumer awareness about (1) micronutrient deficiencies and (2) program activities. Public awareness is key to stimulating and sustaining policy and program initiatives for nutrition. National and local media could be targeted with press releases on scientific research findings, relevant policy information and "human interest" articles related to micronutrients. Such dissemination activities would support OMNI's mission to translate research into policy through developing the awareness of consumers at all levels.

8. Future Project Communication Activities and Research

USAID should continue to develop approaches to reach marginalized populations with micronutrient interventions. Many of the people in greatest need are not being reached, not having access to health services and information channels in the same way that others do. They include jobless, homeless, landless people; families where adults (and often children) must work long hours to make ends meet and are not reached by traditional community outreach programs; and migrant and/or refugee populations. HKI in Bangladesh is trying new ways to meet the needs of the urban poor for food security with their urban gardening project, an approach that should be evaluated for its potential to adapt to even more marginalized populations.

USAID should also begin to develop process indicators for long-term behavior change projects that can assess the progress of change in a given direction. This would include an examination of how the learner (individual or organization) uses communication channels when the connection with information is first made, as new knowledge and skills are assimilated, and as new informational needs emerge. Longitudinal studies could provide insight into the process of change and trends in the needs for information to support that process.

RECOMMENDATIONS

- OMNI-FS should review its overall communication priorities and consider more clearly separating project communications and information dissemination, as a way of ensuring a high and effective level of activity in each area.
- OMNI should reconvene and vigorously support a Communications Working Group among its partners, to give the program a basis from which to develop creative approaches to behavior change interventions.
- USAID should explore and support models to train health planners and communications professionals in the assessment, design and management of comprehensive micronutrient communication strategies. This is particularly salient with regard to the current trend towards decentralization of health services. Training models should tap the expertise of the private sector in areas such as food production, product and service development, distribution mechanisms and marketing.
- OMNI-FS should emphasize development of state-of-the-art approaches to communications promoting fortification. This means merging public health interests with private sector food industry expertise in developing models for marketing and distributing fortified foods, especially to at-risk populations.
- USAID, through OMNI, should fund a forum or series of meetings for the exchange of communication and behavior change theory and experience, keeping the project on the cutting edge of thinking and practice in this area.
- OMNI is urged to prepare and disseminate case studies documenting the strengths and weaknesses of project communication initiatives such as the

Bolivian Vitazucan project and the Philippines Sangkup Pinoy Seal program on an ongoing basis.

- USAID should continue to investigate, develop and test behavior change strategies to support micronutrient interventions, including establishing and monitoring of indicators, evaluating their achievement, setting timelines and developing flexible funding mechanisms.

D. THE MICRONUTRIENT RESEARCH AGENDA AND ITS APPLICATION

1. Introduction

USAID's support for research on micronutrient deficiencies aims to make its most direct contribution to SO 3, through developing and disseminating new, more cost-effective interventions to improve child survival (Intermediate Result #3.1). It has also, and increasingly, aimed to contribute to SO 2, to increase the use of client-centered safe pregnancy, women's nutrition, family planning, and other key reproductive health interventions, and to SO 4, to reduce the transmission of HIV.

USAID's micronutrient portfolio has had a substantial research component since its inception in the 1970s. It can be cogently argued that this is one of the key reasons for the portfolio's success. To date, the major focus has been on vitamin A deficiency (VAD). Smaller though important investments have been made in research on iron deficiency anemia (IDA) and to a much lesser extent, in research on zinc deficiency and iodine deficiency disorders (IDD). For all four micronutrients, USAID has primarily supported applied field research and operations research.

When available resources diminish, there is a strong temptation to cut investments in research in order to protect programs. In retrospect, this often proves to have been shortsighted. In the particular case of micronutrients, the review team found that USAID's investments in both applied and operations research have been extremely cost-effective. Their impact has been substantial in terms of the Agency's own policy and resource allocation, resulting in a major contribution to USAID's strategic objectives in health. It has been even greater on the policies and resource allocations of governmental and non-governmental health programs in developing countries, as well as on other funders (e.g., World Bank, UNICEF, bilateral donors), and technical advisory groups (e.g., the Micronutrient Initiative,

IVACG, WHO). Given the technical expertise which has been built up within USAID and its partner institutions, the Agency is in an unparalleled position to make future investment in micronutrient research translate into concrete results in terms of effective health and nutrition programs in developing countries.

Although it is clear to those involved, and to the review team, that USAID's investment in applied and operations research on micronutrients has had the effects described above, this has not been sufficiently documented. To better make the case, a review should be carried out whereby annual summaries are compiled of all international investments (not just USAID's) in micronutrient interventions in developing countries over the past 15 years, broken down by micronutrient and by funding source. OMNI would appear to be the most logical entity to compile such a review, perhaps in collaboration with MI. A simple questionnaire would make the process relatively non-threatening to respondents.

2. Applied Field Research

a. Vitamin A Deficiency (VAD)

In the 1970s, USAID was one of the major supporters of blindness prevention programs in developing countries. USAID-funded research in Indonesia (carried out by JHU and HKI researchers and Indonesian colleagues) demonstrated that corneal xerophthalmia (a clinical eye condition caused by vitamin A deficiency) was highly prevalent in southern Asian children, and confirmed that this condition was frequently fatal. Within this same set of studies it was observed that even children with milder, non-corneal xerophthalmia were at a greatly increased risk of dying. This key observation led to a series of population-based, randomized controlled field trials of the impact of vitamin A supplementation and food fortification on child survival during the 1980s and early 1990s, most of which were USAID-funded.

The trials showed that, on average, improving vitamin A status of children from vitamin A deficient populations can reduce child (1-5 year) mortality by 23%. Since VAD is common in most developing countries, it has been estimated that effective VAD control interventions could prevent 1.2 to 2.5 million child deaths each year. Such dramatic intervention effects are very rare in public health. They are even rarer when the intervention, like vitamin A, is cheap. These findings formed the basis for a major, USAID-led, international initiative in both research and program development to prevent vitamin A deficiency and its consequences for child health, survival and vision.

Since 1985, most USAID-funded applied field research has been carried out by Johns Hopkins and its collaborators around the world under two Cooperative Agreements (CAs). To date, approximately \$20 million has been spent through these CAs (5116.01 and 5116.02), both due to end in September 1997. A detailed study of the work carried out under the CAs shows that the return on investment has been very impressive. Furthermore, JHU estimates that the critical mass of research on micronutrients which has been sustained by USAID CAs with JHU has attracted an additional \$10 million to the University from other funding sources for micronutrient research.

As well as the ground-breaking studies described above, the JHU research has provided reliable estimates of the magnitude and severity of xerophthalmia in several countries, which have been used both to advocate for VAD control programs and to target them to the most needy populations. Research in Tanzania, which was extended by other groups in South Africa and elsewhere, demonstrated that adding vitamin A supplements to the treatment of young children admitted to hospital with severe measles could substantially lower measles case fatality rates. This led to an international policy recommendation that vitamin A supplements be a part of measles treatment in most of the world, including the United States.

More recently, the CAs have supported research which showed a strong association between maternal vitamin A status and mother-to-child (vertical) transmission of HIV/AIDS. This has led to ongoing trials to see whether vitamin A supplementation of HIV positive pregnant women reduces vertical transmission of HIV and improves maternal and infant health and survival. A related study in Zimbabwe is providing vitamin A supplementation to postpartum women and their infants, to examine its effect on HIV transmission during breastfeeding.

JHU researchers and collaborators (with support from USAID's global micronutrient program, regional bureaus and country offices, and other USAID-funded groups such as the VITAL and OMNI projects, IVACG, and HKI) have been remarkably diligent in bringing the results of their research to the attention of other scientists, policy makers, program managers, and the general public, within the U.S. and abroad. This has been despite the reluctance of many agencies (including many within USAID itself) to commit resources to nutrition interventions.

The effectiveness of this international advocacy for the prevention of VAD and its devastating consequences has been greatly enhanced by at least three other factors:

- (1) The long-term involvement of USAID and its partner agencies in the countries where the applied field research has taken place (e.g., Indonesia, Nepal, Philippines), especially when they have encouraged and assisted the countries to implement programs which respond to the results of the research studies. Where the latter has not occurred for whatever reason (e.g., the South Pacific Islands, Papua New Guinea, Tanzania), the local impact of the research findings has been considerably diminished.
- (2) The long-term support given to international bodies such as IVACG, WHO, and UNICEF, and to joint workshops with these and other agencies, which have brought together researchers, policy makers, and program implementers, and provided a forum for wide dissemination and discussion of research findings.
- (3) The creation of mechanisms (such as the VITAL and OMNI projects) by which countries can gain access to support and technical assistance from USAID for the implementation of VAD control programs, although this has been limited by a lack of continuity in some of these support mechanisms.

The demonstration of the remarkable cost effectiveness of vitamin A supplementation and fortification interventions has led directly to a shift in the allocation of health-related resources into VAD prevention and control programs in many of the 60 developing countries where WHO figures indicate that VAD is an important public health problem. It has also led to greater interest in the contribution which other micronutrient interventions can have on health and survival of deprived populations throughout the world.

But although the pioneering field research described above has answered many key questions and given policy makers much of the information they need to direct programs, it has also generated pressing new areas of inquiry. Many of these are within the field of operations research, but others need further basic or applied research. Examples of important unanswered applied research questions related to VAD are listed in Table 4 (page 63). The list is neither exhaustive nor exclusive. Further areas have been suggested by researchers at JHU (see Supplement 10, page 113-114).

The flexibility of the USAID/JHU CA has allowed studies to be set up to try to answer many of these questions as they have arisen. For example, three trials have already been conducted of the impact of vitamin A supplementation on

Table 4. Examples of Important Current Questions Related to Vitamin A Deficiency Requiring Applied Field Research

- What is the bioavailability of vitamin A and its precursors within the various major foodstuffs consumed by poor people in developing countries? What food processing, storage and preparation procedures increase or decrease this bioavailability?
- Can cheaper and better methods be developed for the assessment of vitamin A bioavailability of provitamin A in foods?
- What is the extent and importance of VAD in groups both younger and older than 6 to 71 months?
- Are there synergistic or antagonistic effects of vitamin A on the response to infant vaccines?
- Is VAD causally related to an individual's susceptibility to infection with HIV through vertical transmission from an infected mother and/or through susceptibility as an adult to sexually transmitted infection?
- Is VAD causally related to the rate of progression of HIV disease?
- Can improved field methods be developed for the assessment of vitamin A status in both individuals and populations (e.g., using modern, micro-immunological techniques within finger-prick blood samples)? (See Supplement 11, page 115.)
- Can effective dietary interventions to improve vitamin A status be developed and implemented on a large scale?
- What are the effects of other micronutrient deficiencies on vitamin A status, and vice versa?

young infants, and others will soon be completed. A major trial in Nepal of the impact of vitamin A supplementation of pregnant women on their own and their infants' health and survival will soon be completed. USAID has sponsored or co-sponsored expert meetings on the bioavailability of vitamin A precursors in fruits and vegetables, and intends to support further research in this area.

In sum, the applied field research agenda remains large, pressing and evolving. Further investment in it, at least over the short and medium term (five to ten years), is likely to result in major returns on investment in terms of improved programs and more cost-effective targeting of international health resources.

b. Iron Deficiency Anemia (IDA)

During the 1970s, '80s, and early '90s, USAID-supported basic and applied research which helped to develop specific indicators of iron deficiency (e.g., ferritin and the transferrin receptor), identified potential mechanisms for fortifying foods with iron (e.g., ethylenediamine tetra-acetic acid [EDTA]), elucidated many of the issues related to iron bioavailability, and showed that IDA decreases physical work performance.

Despite these advances and considerable investments in iron supplementation programs as part of antenatal care, there are remarkably few examples of successful IDA programs in developing countries. Supplementation programs have been severely hampered by: (1) the logistic problems associated with daily (or weekly) dosing with iron; (2) the frequent, mild side effects associated with iron supplements; and (3) the lack of any reliable, cheap, non-invasive method of identifying severe anemia.

Recently JHU, under its USAID CA, has conducted a major review of the current state of knowledge related to iron deficiency and its control. It showed strong evidence that severe IDA (hemoglobin concentration (Hb) <70g/L) during pregnancy substantially increases a woman's risk of maternal mortality, her child's risk of low birth weight, and subsequent infant and child mortality. The review also confirmed that mild to moderate IDA (Hb 70-110g/L) reduces physical work capacity in adults and cognitive development in children. However, the evidence is by no means conclusive as to whether mild-moderate IDA in pregnancy causes increased maternal or infant mortality or morbidity (apart from the mother's capacity for physical work), and whether mild-moderate IDA in infancy and childhood causes/contributes to morbidity or mortality.

Yet severe IDA rarely affects more than 5 to 10% of individuals, whereas mild-moderate IDA is extremely common, often affecting two thirds or more of pregnant and lactating women and over 50% of young children. If mild-moderate IDA in women and young children has a substantial impact on maternal, infant and child mortality, the true potential impact of IDA control programs may be even greater than is currently thought. For example, even if the risk of dying in an individual child who has mild-moderate IDA was only increased by a small amount, since this degree of IDA affects a very high proportion of all children in developing countries, effective interventions to reduce or eliminate it would have a large absolute impact on the number of child deaths globally. This information is also needed to assess whether it would be more cost effective for programs to target only those women and children with severe IDA, or to attempt to cover all women and children.

JHU proposes to start a major program of applied research to better define the health impacts of IDA in women, adolescents, and young children, and to explore the potential to improve IDA interventions. The latter research will include exploring the health impact of alternative combinations and dosages of iron supplementation and anthelmintic treatment in women, adolescent girls, school children, and young children, in populations with and without falciparum malaria.

Innovative approaches will be required to overcome the ethical constraints which arise from what is already known about the impact of mild-moderate IDA on physical work performance and cognitive development. Alongside this field research, the JHU group plans to assess the performance of the various existing indicators of IDA and, where necessary, attempt to improve them. An impressive start has been made on this work, with studies linked to ongoing research on vitamin A and zinc deficiency in Nepal and Peru, and new research projects in Tanzania and China.

No other agency plans to support a significant level of applied field research on IDA to answer the questions delineated above. For example, such research is not part of the World Bank's main micronutrient mandate. Hence, the portfolio review team strongly endorses JHU's research plans, and urges continued USAID support.

c. Iodine Deficiency Disorders (IDD)

UNICEF has taken the lead internationally in supporting IDD prevention and control programs, and plans to continue to invest heavily in this area. Partly as a result of this, USAID's support has largely been limited to providing technical

assistance on quality assurance and control systems, building on their experience with similar issues in VAD control programs.

Over the past several years, USAID has provided limited support for applied research on IDD where the Agency felt that it had an opportunity to fill a gap or had particular expertise, such as in development of improved quality assurance and control systems. But the Agency's overall investment in IDD research has been small relative to that made in research on VAD or even IDA. Although such strategic funding should continue, especially in countries where USAID is supporting integrated micronutrient deficiency control activities, the review team does not recommend a major new initiative on applied research on IDD, for four reasons:

- (1) The historical lack of USAID investment in applied research on IDD, coupled with UNICEF's commitment to it
- (2) The general acceptance of the principle that prevention of IDD should be a priority where it is a public health problem
- (3) The fact that the technology (mainly through salt iodization) is by now well tested and understood
- (4) USAID's extensive commitments to applied research on other micronutrients, and the need to avoid spreading resources too thinly, especially given recommendations for increased investments in applied research on iron and zinc deficiency.

It is essential, however, that USAID continue to monitor the research which is conducted on iodine, and to ensure that the lessons learned from USAID-funded research, as well as from programs on other micronutrients which have direct relevance to IDD, are effectively communicated to those agencies which are focusing on IDD (e.g., UNICEF, the Micronutrient Initiative, the International Council for Control of Iodine Deficiency Disorder [ICCIDD]).

d. Zinc Deficiency

Partly as a result of the findings on the importance of VAD to child survival and health, there has been a recent upsurge of interest in the potential importance of other micronutrients, especially zinc. Once more, through JHU, USAID has been at the forefront of relevant research, which has revealed that zinc deficiency may

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be associated with increased risk, severity, and duration of both acute and persistent diarrhea, and acute lower respiratory infections. Recent and current research supported through the USAID/JHU CAs include studies in Peru, Nepal and Papua New Guinea on the impact of zinc supplementation during pregnancy, in infancy and in young childhood.

If the early indications are substantiated that reversing zinc deficiency may be responsible for important health and survival benefits in both women and children, the next major challenge will be to develop and evaluate improved methods for the delivery of zinc within public health and nutrition programs. Currently the only widely-available method is daily oral supplements. Improved, low cost field methods will need to be developed to measure the zinc status of populations and individuals. Current methods are both expensive and technically difficult to use in the field and in the laboratory.

It will be important for USAID to ensure that all its support for research on this topic is well coordinated, especially since research is being funded both through CAs with the HN Office and through the Child Health Research Project.

e. Other Micronutrients

Other micronutrients (e.g., selenium, magnesium, copper) were not reviewed in detail, but none are currently thought to have the potential public health importance of vitamin A, iron, iodine, or (possibly) zinc. It will be important for USAID to keep in touch with research developments involving these micronutrients, so as to be in a position to respond to important findings or initiatives if they develop.

f. Other Applied Research

Although most USAID funding for applied field research on micronutrients has been through the JHU CAs, \$918,000 was allocated to a CA with the International Food Policy Research Institute (IFPRI). This funded exploratory work on the integration of nutrition research into the work of the Institute, and of the international network of agricultural research institutes it collaborates with through the Consultative Group on International Agricultural Research (CGIAR).

The CA with IFPRI has had three principle elements. The first was the introduction of nutritional components into the large household surveys of agricultural production and food security which IFPRI supports. This has

occurred, although the different perspectives and requirements of agriculturalists, economists and nutritionists have not always proved easy to combine. Nutrition programs usually require a level of detail and precision on food consumption patterns (including the amounts and sources of each of the major micronutrients consumed) which is difficult to achieve when questions are simply added to a large questionnaire which already takes several hours to administer.

The second focus was on a series of relatively small studies to look at which agro-fishery technologies would have the greatest impact on family consumption of micronutrients. These studies, financed with USAID/Dhaka field support funds, are nearing completion, and indicate that fish culture may make an important contribution in some Asian countries, such as Bangladesh.

The third element of the IFPRI CA was the exploration of the potential of identifying strains of staple food crops (rice, wheat, maize, cassava, beans) which are rich in zinc, iron, and beta-carotene, and using them as the basis for selective plant breeding for micronutrient-dense staple foods. The initial work conducted under the CA was sufficiently encouraging for IFPRI and its collaborators to propose a five-year, \$9 million pre-breeding study. Since USAID's Office of Health and Nutrition has indicated that they are unlikely to be able to support more than a small fraction of this cost, IFPRI is searching for other funders. In the process it will need to answer critics who suggest that the bioavailability of key micronutrients from such foods may be low, with a high proportion lost in milling.

3. Operations Research

a. History/VITAL Contribution

The increase in resources being directed into VAD, IDA, and IDD prevention and control in developing countries has given rise to numerous questions as to what are the most cost-effective intervention strategies in different situations, and how best to maximize the potential of these strategies. As in applied research, USAID has taken the lead internationally in investing in the operations research (OR) needed to provide direction to VAD programs and to solve the numerous day-to-day problems inherent in making such programs work effectively. With an increasing number of programs adopting an integrated approach to micronutrient deficiencies, USAID's involvement has shown the value of relating OR to all three micronutrients, where this is appropriate. It is essential that lessons learned in programs for one micronutrient are carried over into interventions for others,

especially since intervention strategies available (supplementation, food fortification, dietary change) can apply to all micronutrients.

Although some operations research (notably in Nepal) has been conducted within the USAID/JHU CAs, most has been funded through the Vitamin A Field Support (VITAL) Project (1988-1993) and, more recently, OMNI Research (1993-1998). As outlined in section II.B.1, pages 6-7, OMNI Research is supported through a cooperative agreement with the International Life Sciences Institute (ILSI), and a sub-contract with ICRW.

A major focus of the research under VITAL was a series of surveys of the prevalence of VAD in selected countries in Asia, Latin America, and Africa. In countries where there was no pre-existing VAD control (such as Bolivia, Dominican Republic, Ecuador, Nicaragua, Panama, Cameroon, Nigeria, Uganda, four Pacific Islands, and Papua New Guinea), these surveys provided the data needed to assess the scale of the problem, and to advocate for creation of a control program. Along with other situation analysis studies, they gave pointers as to the most appropriate strategies to employ. In Indonesia, for example, a country with an established VAD program, the survey provided evidence that the program (and other social and economic changes) had been successful in virtually eliminating xerophthalmia. The effectiveness of these surveys in changing policy and stimulating VAD control programs has varied considerably, partly as a function of the research capacity of the local implementing agencies, but also because USAID substantially decreased its involvement in several of the countries since the surveys were conducted.

VITAL also supported reviews of knowledge and experience within VAD control programs, focusing on such elements as home gardening, solar drying, fortification, and communications strategies, and provided important TA and financial support to these programs. It helped to identify many of the key OR questions which have subsequently been tackled by OMNI Research.

b. OMNI Research - Role and Focus

OMNI Research is primarily a small grants program, the aim of which has been to identify specific issues which have proved to be problems in a wide range of micronutrient programs around the world, and then solicit operations research proposals related to these problems. So far, OMNI Research has funded 24 OR projects. Nineteen of these are managed by ILSI, while the other five are managed by the International Center for Research on Women (ICRW) through a sub-contract with ILSI.

To date, all OR projects have been identified through a series of Requests for Proposals (RFPs), although unsolicited proposals are now also being considered. The topic areas (nine in number) for which RFPs have been issued were identified as priorities for OR at the first meeting of the international Peer Review Panel (PRP) set up to advise OMNI Research on the development of its agenda and to aid in the selection of research proposals. The number of studies funded under each of the topic areas has ranged from 0 to 5 (see Supplement 12, page 117). Since the data in Supplement 11 were compiled, at least one further study has been funded. Altogether, nine of the 24 studies, or 38%, have related to vitamin A, 8/24 (33%) to iron, 1/24 (4%) to iodine, and 6/24 (25%) to combinations of micronutrients.

Proposals to OMNI Research are first reviewed by members of the PRP. Those which pass are then evaluated for their relevance to objectives of the overall OMNI project by a team representing OMNI Research, OMNI Field Support and the USAID Office of Health and Nutrition, before the final selection of studies to be funded is made. OMNI Research has been at pains to regularly consult OMNI FS staff, especially the person responsible for research within OMNI FS, on both research priorities and decisions on project funding.

It was made clear to the review team that, from the start, capacity building was not a major objective of OMNI Research. As a result, ILSI has deliberately used a "hands off" approach to the management of the 19 studies it has funded. Indeed, the staffing levels and past experience of the core OMNI Research staff would have made any other approach unfeasible, although each funded OR project is assigned an advisor from within the PRP. By contrast, ICRW has built a considerable element of capacity building into the five studies it is managing, including workshops attended by the five implementing groups, and site visits by ICRW staff. It will be important to evaluate the relative cost effectiveness of the ICRW and ILSI approaches to management of their respective studies.

The other principle OMNI Research activity is the organization of technical meetings and workshops to assess the current state of knowledge on issues relevant to USAID-supported micronutrient programs, and the dissemination of the results of these meetings. This activity only started in 1996. Issues covered have included an assessment of the current state of knowledge on micronutrient interactions, and an assessment of relative effectiveness of different technologies to prevent micronutrient deficiencies.

c. OMNI Research/OMNI FS Collaboration

While OR projects implemented by OMNI Research are generally selected for their application across national and regional boundaries, country-specific issues that could benefit from operations research are usually identified by OMNI Field Support staff and USAID Missions. Resulting OR projects have usually been tackled by OMNI FS and its collaborators within the country programs, although they have increasingly fed into the overall agenda of OMNI Research. However, the technical capacity for such OR within most USAID Missions and country programs is very limited. Certainly at the start of the project, the technical capacity for OR within the core staff of OMNI FS itself was also limited, especially since relatively little use was made of project partners at that stage. Although the review team did not probe for this in detail, a clear strategy by which OR had been integrated within OMNI FS-supported programs as an integral part of the implementation of those programs, was not always apparent. More recently steps have been taken to increase the core OR capacity within OMNI FS, both in Washington and in some countries, but the use of project partners has remained relatively low save in a few countries (e.g., HKI in Nepal).

OMNI Field Support has sponsored several workshops and consultations growing out of its OR activities. These have included one on iron interventions for child survival, one on the potential for mass production of iron and/or multi-micronutrient supplements suitable for young children, and one on the bioavailability and bioconversion of carotenoids. They have also supported the production of practical manuals, including one on methods for fortification of sugar with vitamin A.

4. Dissemination of Research Results

USAID has actively supported dissemination of the results of the research it has funded. This has, in the main, been very effective, largely because the Agency has explicitly encouraged and given financial support for researchers to present and discuss their results with policy makers, the private sector (especially the pharmaceutical and food industry), program managers and other researchers. It has also encouraged researchers to involve all these sectors in the design and implementation of their research wherever this is feasible. The sustained involvement of USAID-supported researchers in specific countries (e.g., Indonesia, Nepal) has greatly enhanced the potential for turning research results into programs in those countries.

Within the field of VAD, regular IVACG meetings and joint meetings with other agencies (e.g., WHO, UNICEF, HKI, and the World Bank) which have been organized either through IVACG, the VITAL and OMNI projects, or WHO, have made an enormous contribution to information dissemination and dialogue between the people who generate the research results and those who apply them. IVACG has also published a steady stream of technical guidelines, universally recognized as being both authoritative and practical, which have formed essential reference material for researchers, policy makers and program managers. Several other useful technical guidelines and state-of-the-art reviews have been produced by the VITAL and OMNI projects. (Although substantial, their impact may have been less than they could have been because of the time-limited nature of these projects.)

Although dissemination has been reasonably effective, especially within the research community, the message has not always reached key people within the USAID community, the private sector, and the general public, particularly in developing countries. In future even greater efforts should be made to ensure that these target audiences are reached effectively. This will require careful selection of the kinds of media and messages which are most likely to effect policy and behavior change in these target groups.

As noted earlier in this report, institutional support for IDA activities, including dissemination, has been less dynamic than that for VAD. The International Nutritional Anemia Consultative Group (INACG), which is supported by USAID through a contract with ILSI, has been much less active and effective than IVACG. However, an effort is now being made to resuscitate INACG, evidence of which can be seen in the steps which have been taken to expand its role beyond the traditional one of providing technical information. This has included plans for at least one international meeting similar to those convened by IVACG, and efforts to restructure the group's steering committee.

This is a good time for such activity. The increased investment by USAID in IDA research and programs will generate a substantial interest in IDA internationally and is already attracting a new set of dynamic young researchers and program managers into the field. INACG should be given a chance to respond to this opportunity and fulfill its potential. To do this it is essential that new blood be brought into the association, and a start has been made on this. Using IVACG meetings as a model, INACG should also be encouraged to push ahead with its plans for an international meeting, one which would bring together researchers, policy makers, donors and the private sector. Further regional meetings should also be considered as a way of raising INACG's profile.

5. Impact of Research Portfolio

a. Strategic Objectives

USAID's research on micronutrient deficiencies has made its most direct and substantial contribution to the Agency's SO 3 ("increased use of key child health and nutrition interventions"). Examples include the applied field research which has demonstrated the impact of improving the vitamin A status of young children on child health and survival, and the laboratory and operations research which has developed and tested the cost effectiveness of alternative strategies to prevent and control both VAD and IDA. The result is that there has been an important increase in the proportion of developing countries with micronutrient deficient populations which have effective control programs. These will have resulted in major improvements in child nutrition, health and survival.

USAID-supported research on micronutrients has also made increasing contributions to SO 2 ("increased use of client-centered, safe pregnancy, women's nutrition, family planning, and other key reproductive health interventions"). Examples of this include the recent applied field research on the impact of antihelminths on maternal anemia, and OR on iron fortification as an alternative to supplementation. Current applied field research on the impact of vitamin A, iron and zinc supplementation of pregnant women on maternal and infant outcomes are likely to also have a major impact on reproductive health programs in the near future.

Recent and current research on vitamin A and mother-to-child transmission of HIV may well lead to an important contribution to SO 4 ("reduced transmission of HIV") within the next two to three years.

b. Vitamin A

There is no question that the U.S. has been and remains the prime mover in both research and technical support to programs for the prevention and control of vitamin A deficiency (VAD) globally. This is largely because of the substantial, sustained, and well-coordinated investment by USAID's micronutrient portfolio in both applied field research and, increasingly, in operations research. These, combined with attention to dissemination of research results beyond the research community, have provided the information needed by policy makers, program managers, and funders to quantify the scale of the VAD problem in developing

countries, the impact of VAD on child health and survival, and the programmatic approaches which can be most effective in reducing VAD in different settings.

USAID Missions and global support programs have helped to initiate and support several national VAD control programs over the years, but the research findings have also prompted national governments, other bilateral donor agencies, and governmental and non-governmental agencies such as the World Bank, HKI, WHO, and UNICEF to invest substantial amounts in VAD control programs. National governments and donors turn primarily to U.S.-based institutions (including USAID, OMNI and JHU) for policy and technical advice on how to maximize the potential of their investments in VAD control. Thus, the indirect consequences of USAID's investments in vitamin A research are substantially greater even than the direct effects on the Agency's own policy and resource allocation.

Important research questions remain, however (section D.2.a. and Table 4, pages 60-64), and USAID and its partner organizations are uniquely placed to answer them. Such research is very likely to have a major further impact on USAID's ability to meet its strategic objectives.

c. Iron

Over the years, USAID has also made a substantial contribution to furthering knowledge of the health consequences of IDA, developing indicators of iron deficiency, and identifying and testing alternative approaches to increasing iron status. It is now clear that IDA substantially reduces the well being, productivity, and (at least in severe anemia) the survival chances of both mothers and children. Despite this, for reasons described above, there are few examples of successful, large scale, sustainable IDA control programs in developing countries. There are also important constraints on the assessment of iron status in routine clinical settings in poor countries. Although enough is known to be sure that the benefits of effective IDA control programs can be substantial, too little is still known of the health impact of IDA, especially of mild-moderate IDA in pregnant women, infants and children. Further applied and operations research is needed within these areas.

d. Zinc

The pioneering research on the health impacts of zinc deficiency which has been carried out under CAs with JHU appears to hold great promise. This research was only possible because of the flexible nature of these agreements. The initial

indications that zinc deficiency may substantially increase the incidence, severity, and duration of common childhood infections need to be confirmed. If so, for effective interventions to be put in place, it will be essential that improved delivery systems are developed and tested; the interactions between infections, zinc, vitamin A, iron and other micronutrients explored; and improved field methods of measuring zinc status developed and tested. USAID will be in an excellent position to continue to lead this work.

6. Lessons Learned

a. Balance and Impact of the Research Portfolio

Taken as a whole, USAID's portfolio of research on micronutrients has been successful in maintaining a clear focus on contributing to the Agency's strategic objectives. Yet, while doing this, it has managed to retain the flexibility to identify and follow up on new research questions of importance to those objectives. This has been, to a large degree, because of the particular interest and continuity of the leadership of the research portfolio within the Office of Health and Nutrition, and the high quality of the researchers within the partner agencies.

The cost-effectiveness of USAID's investments in micronutrient research has been, and is likely to remain, extremely high. At a relatively low cost, the research has led to major, new, highly cost-effective interventions. These are increasingly being applied within programs directed towards child health, nutrition, and survival in developing countries. As a result, many lives are being saved and the quality of many more improved.

By its very nature, good research cannot provide completely predictable outcomes; there must be an element of risk or the results of the research will be predictable and therefore largely irrelevant. However, the returns on investment in research are likely to be highest, and the risks minimized, when a team of excellent researchers with a proven track record in innovative research are involved in a flexible, sustained partnership with those commissioning the research. The USAID/JHU CAs provide a fine example of the success of this approach. As one would expect, these CAs have supported a small number of research studies which have not resulted in any major practical outcomes for programs (e.g., conjunctival impression cytology), but these have been far outweighed by the sustained production of results which have helped to make public health programs more effective.

The relative balance between the more fundamental epidemiological and laboratory research on the one hand, and OR on the other, changes with time. USAID-supported research on vitamin A illustrates this well. Initially, almost all of the (relatively small) research budget went to applied research. When this clearly demonstrated the potential effectiveness of interventions to reduce VAD, the need increased for investment in OR to improve program interventions and establish what works best in different settings.

However, this does not necessarily mean that the absolute expenditure on applied field research should decrease. While there are still key questions related to the potential health and development impact of micronutrient interventions, these must be investigated, for it is the research of today that will improve and shape the programs of tomorrow. The key test is whether the applied field research which is supported is targeted at answering questions that have a direct relevance to important programmatic issues. So far, the USAID micronutrient portfolio has been very successful at doing this. Current examples include the work on whether vitamin A supplements in pregnancy reduce mother-to-child transmission of HIV in HIV-positive mothers, whether they improve maternal and child outcomes in HIV-negative mothers, and the public health impact of mild-moderate iron deficiency.

A conscious effort to create and maintain an active dialogue among researchers, politicians, policy makers, program managers, and the private sector has been clear within the USAID-supported research on micronutrients. This has greatly increased the impact of the research on policy, programs, and ultimately on the health of developing country populations. This needs to be even more actively pursued in the future.

In order to ensure that USAID keeps the research it funds focused on the areas where it is at a comparative advantage relative to other funders of micronutrient-related research, the Agency should continue to regularly review its research priorities in the light of new research findings and changing program needs. It should take maximum advantage of international meetings attended by other relevant donors, such as ICN/SCN, ICACG and INACG meetings, to obtain a clear picture of what other donors are funding and inform them of USAID's current research funding priorities. It is also likely that occasional special meetings with other relevant research funders and technical groups (MI, UNICEF, the World Bank, NIH); bilateral organizations (ODA, SIDA, CIDA and IDRC); research-oriented foundations such as the Edna McConnell Clark Foundation, Nestle, and Rockefeller; and private sector initiatives such as ROCHE's Sight and Life program, will be extremely helpful in terms of information exchange and

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opportunities to build partnerships. Finally, closer to home, the team urges the G/PHN/HN Office to meet regularly with other colleagues within USAID Global Programs who are funding micronutrient research.

b. OMNI Research and the Small Grants Program

The approach used by the small OR grants program within OMNI Research has involved the issuing of specific requests for proposals (RFPs) to address clearly defined problems. This has ensured a focus on key programmatic questions, although the fact that the RFPs were issued in a serial manner with relatively short deadlines may have limited the number of top quality proposals received. Also, there appear to have been important initial misunderstandings and disagreements between some USAID Missions and regional offices receiving RFPs on the one hand, and OMNI Research and the G/PHN/HN on the other, as to the mechanisms that would be used for the selection of both the priorities for research topics and the specific proposals. Several Missions felt that they should have had more say in both, and were annoyed to find that research studies had been called for within their country which did not fit with their own strategic priorities.

Some Missions prohibited OMNI Research from funding OR projects within their countries, leading to considerable confusion in those countries. A further complication was the fact that the OMNI Research project was formulated prior to the launching of the "re-engineering" of USAID, in which there has been an important shift in the locus of control of projects away from Washington and towards the Missions. Missions are being encouraged to focus much more exclusively on projects which are directly targeted at meeting their local strategic objectives. However, at least some of these problems might have been foreseen and avoided by better communication within the organization.

It is too early to judge the effectiveness of the small grants program, since most of the studies have started within the past 18 months, and none have been completed. However, the review team is concerned that the international impact of many of the individual studies on their own may not be great. A special effort will be needed to ensure that the key lessons learned from the 20 to 30 studies which have been conducted through OMNI Research to date are synthesized in the context of other current knowledge on what works, what does not work, and how to maximize impact on intervention programs. OMNI Research already has plans to do this, and is organizing meetings/workshops for this purpose.

Innovative ways of doing this may be needed, such as getting experts within each of the areas covered by the RFPs to work with research teams to produce practical

reviews of the state of knowledge within them. These reviews should be targeted to policy makers and program managers, disseminated not only through publications but also through alternative mechanisms (meetings, videos, etc.), and should be in addition to scientific journal publications. It may be possible to use the review of “what works” currently being carried out for USAID by the National Academy of Sciences as the basis for this.

c. Research Funding and Continuity

Research conducted within VITAL and OMNI has suffered from the stop-start nature of funding mechanisms employed by USAID for these projects, i.e., VITAL ran for several years, was disbanded, and then was replaced by OMNI (comprising the OMNI Field Support contract and OMNI Research CA). Such funding mechanisms have advantages:

- It is possible to use a system of competitive tendering for the contracts.
- They prohibit the formation of fossilized structures and programs, by allowing radical rethinks and new perspectives every five years or so.
- They maintain pressure on the contractors to produce the goods, if they want to stand a chance of being awarded the next contract.

But from a research perspective they also have important drawbacks:

- Inefficiencies are inherent in a series of time-limited projects, in which time and effort are spent building up a new organization, only to wind down again as the five-year limit approaches. This is especially damaging for research continuity.
- Problems occur with continuity of research within USAID-supported countries, since little new can be started within the last two years of the project, and the focus tends to shift away from medium- and long-term goals to delivery of short-term “products.”
- Institutional memory suffers. Although efforts were made to ensure memory was retained during the transfer between projects, facilitated by the fact that the COTR within the G/PHN/HN Office remained the same, most of the

personnel changed between the two projects, with inevitable consequences for institutional memory.

OR funded through OMNI Research has not always been conducted within countries where OMNI Field Support is active. This was at least partly because of the separate mechanisms for funding OMNI Field Support and OMNI Research, and the pressure on the OMNI Research team to have studies up and running as soon as possible after the start of their project. It was also because of a conscious decision to trawl more widely for good ideas and research studies. As mentioned above, it is too early to make a conclusive assessment of the merits of this approach. But the team urges that within the next round of funding OR not be considered as a series of discrete research studies but, to the maximum extent possible, be considered and planned as an integral part of program development, implementation and evaluation in "OMNI" countries.

d. A More Integrated Approach to Operations Research (OR)

An integrated approach to OR will require very close collaboration between OMNI Research and OMNI Field Support. It will require agreement between program managers, OR specialist(s) and USAID, that specialist(s) will have sustained access and input to the program, subject to periodic review by all parties. This is to ensure that the OR team has a stake in the long-term success of a country program and the program staff has an incentive to share, rather than attempt to cover up, the real problems and constraints they are facing.

The results of a collaborative, integrated approach to OR and country programs will be more difficult to quantify than the results of discrete OR studies, let alone those of applied field research. It is quite possible that a low-profile, integrated program of OR could have a major impact on the health, nutritional status and survival of the populations of developing countries through relatively small incremental gains in program effectiveness, both within the specific program in which the OR was conducted, and within other programs which learn from that experience. However, since it can be extremely problematic to attribute such effects to OR per se, the success of the OR must be judged on the success (or otherwise) of the programs themselves. Systems need to be put in place to document and, where possible, quantify the contribution of the OR component within integrated programs.

7. Evaluation of Mortality Impact

Donors often want to have a direct measure of the impact of their health investment on mortality. Attempts to provide such a measure are almost invariably futile, usually provide erroneous answers, and waste large amounts of effort and money which could be better spent on ensuring that the intervention is well implemented. The rationale for this statement is given in Supplement 13, page 119. Quite correctly, the micronutrient portfolio has focused its efforts on implementing interventions which have been shown to reduce mortality, morbidity and micronutrient deficiency within rigorously conducted controlled trials, and then monitoring the adequacy, utilization, and population compliance with these interventions.

RECOMMENDATIONS

- USAID should continue to make substantial investments in micronutrient research over the next 10 years. Such investments are likely to be highly cost effective, given the technical expertise built up within USAID and its partner institutions over the past decade.
- There is a clear need for further applied field research on VAD. This might include the issues listed in Table 4, page 63. The most effective means of doing this is likely to be through further cooperative agreements.
- USAID's support for applied field research on IDA should be continued and if possible, increased. Work should focus on defining the impact of mild-moderate maternal, infant and child IDA on maternal and child health; assessing alternative approaches to improving iron status; testing low-cost field methods for measuring iron status.
- USAID's support for applied field research on the health impacts of zinc deficiency should be continued and if possible, increased. Focus should be on substantiating (or refuting) studies which indicate that reversing zinc deficiency may have health benefits in women and children; developing and field testing delivery methods; testing low-cost methods for measuring zinc status of populations.
- Although USAID should continue to make small strategic investments in research on IDD where the Agency and U.S. institutions have a comparative

advantage, such as in quality assurance and control, a major new initiative in IDD research is not advised.

- Evaluation of routine USAID-supported VAD control programs should focus on the quality and effectiveness of program interventions (e.g., training, service delivery), and their utilization. Evaluation of a specific program's impact on mortality and morbidity is not necessary, may well give misleading results, and is likely to be a waste of money.
- Key lessons learned from the 20 to 30 OR studies funded through OMNI Research should be synthesized and articulated within the context of other current knowledge on what does and does not work, and how to maximize the potential of the former.
- In the future, the main focus of USAID's investments in OR related to micronutrients should be on that which forms an integral part of programs rather than on discrete OR studies per se. However, the learning and widespread dissemination of lessons which are of wider applicability should be a priority.
- Dissemination of research results within USAID, to other U.S. Government agencies, and to other bilateral and multilateral donors will best be done through short bulletins which summarize the key "take home messages" of research findings, and occasional joint meetings to exchange ideas and research results.
- USAID should continue to support occasional state-of-the-art reviews and meetings for the dissemination and discussion of research results. These include IVACG and (a revitalized) INACG conferences and other ad hoc meetings, where possible jointly sponsored by WHO, MI, UNICEF and/or others.
- Annual estimates should be compiled of all international investments (not just USAID's) in micronutrient interventions in developing countries over the past fifteen years.

E. PORTFOLIO MANAGEMENT

1. Introduction

The full range of funding mechanisms through which USAID supports micronutrient activities is outlined in Section II. B., pages 6-10 (Funding Mechanisms Covered by the Review). As requested in the SOW, the portfolio review team focused its attention on the management of the three mechanisms which fall within the purview of USAID's Office of Health and Nutrition (G/PHN/HN): OMNI (both OMNI Research and OMNI Field Support); Vitamin A for Health; and Food and Nutrition Monitoring and Support. It looked at issues of balance among the many participants, the extent to which activities overlapped or filled distinct niches, management of resources by individual cooperating agencies, working relationships with USAID, and, to the extent possible, cost effectiveness.

One of the team's overriding impressions was of the complexity of the overall micronutrient picture within the Agency, reflected in the large number of acronyms and entities involved and the variety of their mandates. Complexity is not in and of itself a negative. Micronutrient program support needs are substantial, especially since a vigorous research capability must be maintained to continue to build the case for micronutrients at the same time as field implementation activities mature and proliferate. Yet it was not always possible for the team to determine whether certain similar programs were complementary or duplicative. We can only urge that, when and if new micronutrient agreements are considered, careful analysis be conducted to determine whether they will meet hitherto unmet needs, or whether the work contemplated could be carried out under existing agreements using already authorized funds.

The entity into whose management the review team delved in the greatest depth was OMNI. It commands substantial funding, and is itself made up of a large number of organizations. The following paragraphs are thus divided into two sections. One touches on the management aspects of the various cooperative agreements (CAs) and the other, non-contractual funding arrangements supported under the G/PHN/HN Office (with the exception of the OMNI Research CA which is discussed in the research chapter of this report.) The other looks specifically at the management of the OMNI Field Support contract. Comments on USAID management of its micronutrient portfolio are incorporated as appropriate.

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2. Cooperative Agreements and other Non-Contractual Arrangements

The team found no particular management crisis points within either the Vitamin A for Health or the Food and Nutrition Monitoring and Support program mechanisms. The PAMM program at Emory University, Peace Corps, IFPRI and IMPACT have each filled particular training, TA and field research niches under the Food and Nutrition Monitoring and Support project authorization. All are more or less concluded, save for IMPACT, which has a one-year unfunded extension to provide TA to PVOs using Title II funds for micronutrient initiatives.

Two recipients of CAs under the Vitamin A for Health mechanism, JHU and HKI, are highlighted because of the size of their respective funding agreements. The team makes a point of this because, although JHU and HKI are also subcontractors under OMNI FS, we consider it important that they also continue to receive independent USAID support through centrally funded CAs for their micronutrient research and field support activities.

- Johns Hopkins University has a distinguished record which has placed it in the forefront of applied research on micronutrients. It's leadership role in the field, highlighted by the Indonesia vitamin A studies, is well described in the research section of this report (section III.D. pgs. 59 to 81). JHU's approach to applied research insists that:
 - ▶ the questions the research seeks to answer be generated by health needs and realities in the field, rather than by academic preferences
 - ▶ its research be oriented to making results public as soon as feasible to give them the best opportunity to influence the policy agenda
 - ▶ once results are known and understood, the focus should move to effective intervention and coverage, rather than on needlessly redoing the science.

The team found persuasive not only JHU's professionalism and commitment, but also its arguments in favor of retaining the flexibility inherent in a centrally funded CA. While it has been able to provide useful technical assistance in its role as OMNI subcontractor, it is certain that, in terms of "moving the micronutrient agenda," its most important work is that which is centrally funded. Central funding decisions on research priorities and projects are far more likely to be taken from a global perspective, rather than one influenced by particular national or regional preferences, and thus have the best chance of achieving the most progress in the shortest amount of time.

- Similarly, the review team felt that HKI has carved for itself an important niche in micronutrient programming, one which is enhanced by its access to central funds through its CA with USAID. As the Philippines and Nepal sketches in earlier chapters reflect, HKI has made itself the leading PVO dealing specifically with vitamin A deficiency. It has unique experience in promoting and implementing VAD programs at the community level and in working within decentralized health systems. It knows its skills and its mission and unlike PVOs in other fields, has resisted the temptation to diversify and thus risk diluting the impact of its program strategies.

Some USAID field people have faulted HKI for being too much the “crusader” for VAD programs, unwilling or unable to view its particular interest in a broader health context and market it accordingly, for example, to skeptical USAID Missions. The criticism is worth noting, because style and context are important in making the case for interventions. But the substance of HKI’s work, as reflected in projects in the Philippines, Bangladesh, Nepal, Niger and elsewhere, far outweighs this criticism, and makes it an important resource for the field.

HKI is also an OMNI subcontractor, and that relationship has its own complexities. In Nepal, under OMNI, HKI has been given full responsibility to manage the National Vitamin A Program, with impressive results. In the Philippines, however, where HKI has been on the ground for a decade, and where its representatives have developed close and effective advisory relationships with the GOP Department of Health, OMNI now has separate representation as well. The two entities share an office and have developed an effective rapport. But when HKI’s current CA runs out in the next year, and if it is not renewed for its work in the Philippines, an awkward situation could ensue, with the more experienced, better known entity being under the control of the younger, less experienced one. On balance, the review team feels that it makes sense for USAID to continue supporting HKI with central funds, as well as through OMNI. That independence will ensure it the flexibility to maximize its micronutrient skills and experience.

3. The OMNI Contract

Although tasked to review the entire USAID micronutrient portfolio, the review team could not avoid spending a major part of its time looking at and thinking about OMNI. That the OMNI Field Support contract is such a large consumer of USAID micronutrient funds had much to do with that. But so did the fact that OMNI has been uniquely controversial in its three years of existence, giving rise to numerous opinions and informal assessments, both within and outside of the

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Agency. Not infrequently it occurred to the team that OMNI deserved its own, full-dress evaluation, rather than a less formal review that is only part of a larger whole. Knowing this to be unlikely, we sought to give OMNI the most objective possible assessment in terms of its history, U.S.-based management and field operations.

a. History of the Contract

In the manner of its founding were sown many of the seeds of OMNI's later difficulties. Unlike the normal process of consortium building in preparation for a bid for new funding, the announcement by USAID of the OMNI Project prompted eight interested parties—JHU, HKI, Emory University, PATH, the University of California at Davis, ILSI, the University of Arkansas and Manoff International—having they felt unique capabilities to offer an international micronutrient effort, to band together and then recruit their own management entity. By their own admission, they saw the latter filling a largely administrative role, as proposal writer and manager of funds, leaving the consortium free to make the important technical and programmatic decisions.

The management entity the group selected, John Snow Incorporated (JSI), a frequent USAID contractor with long experience managing complex projects, well understood that the role of prime contractor is more than administrative. Rather, it has ultimate and highly specific responsibility for contract management, coordination and disposition of funds, with a degree of accountability to USAID requiring that it be in full control of the enterprise. In retrospect, the naivete shown by the consortium, which included many supposedly USAID-savvy institutions, in bidding for a contract with such a perspective was, at best, surprising. Equally so was JSI's failure to grasp the perceptions of its prospective subcontractors of its and their roles.

Once the OMNI contract was awarded to JSI, the fruits of these miscalculations became quickly apparent, and only three years later have the resulting bad feelings begun to subside. Subcontractors balked at the prime contractor's management requirements, starting with such routine functions as sign-off and clearance. They were, in varying degrees, unhappy from the outset about the size of their individual "pieces of the action," in terms of personnel and field activities that could be applied against their individual budgets. Quarterly meetings of consortium members, intended to be the key working meetings of the contract, were acrimonious and unproductive. Under the best of circumstances, JSI as "prime" would have had difficulty in keeping such a large number (too large, in

the opinion of the review team) of institutions happy, and the circumstances were far from the best.

At the same time JSI was having to deal with serious personnel problems among top project staff, problems which lingered throughout the project's first two years. OMNI Research and OMNI Field Support were not well synchronized. Staff morale was low. But as the end of the third year of the contract approached, things were starting to turn around. While still unhappy—most have, even now, obligated funds at levels well below their funding ceilings—subcontractors have adjusted to management realities and are starting to pull together. Senior management is stable, and staff morale improving.

b. Current Management Situation at OMNI Headquarters

The review team was struck, at times even distressed, by the range of negative attitudes and degree of mistrust voiced about OMNI's performance to date by individuals both within and outside of USAID. This was even as the team was also struck by the commitment and hard work shown by OMNI staff, notwithstanding their difficult circumstances. It could only conclude that the ill-advised decisions and bad feelings of the project's early years had, in peoples' minds, rendered an initiative for which they had high hopes largely ineffectual.

USAID management of the OMNI contract must, under the circumstances, also be called into question. Probably because management problems surfaced within OMNI so quickly after it was launched, G/PHN/HN adopted very much of a hands-on oversight approach, to try and ensure that problems did not get out of hand. But even as problems have been sorted out, a degree of micro-management has persisted that is unusual even for the stringent management requirements of a contract. It has had the effect of stifling creativity, complicating the still fragile relationships between JSI and its subcontractors, and limiting programmatic flexibility.

It is often mentioned that the OMNI FS contract has only two more years to run under its current funding authorization, with the unspoken inference that there is no way that it can achieve real success in such a limited period of time, given all that has gone before. The review team sees it quite differently. Two years is ample time in which to build a successful enterprise. Subcontractor links are on the mend and, with sensitive handling, can flourish. The staff is complete and committed, and senior management now has its trust. Given its head, and the opportunity to take some risks, this is a program which can yet fulfill USAID's original high hopes and expectations for it.

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c. Management of OMNI Field Operations

Management difficulties at headquarters have had their impact abroad. Uncertain decision making and lack of unanimity within the consortium on program directions have hindered progress. The result is that OMNI's field operations appear fragmented, and it has not become fully operational in all of its intended long-term emphasis countries.

The review team recommends a full and immediate review of OMNI's list of emphasis countries, and urges readiness to make changes if opportunities warrant. Once the list has been finalized, all efforts should be focused on building those country programs, even at the expense of letting individual activities in other countries be put on the back burner for the time being. It also recommends maximum concentration on Africa to try to bring the percentage of effort in Africa closer to the 50% of the whole called for in the original OMNI Project Paper.

Any emphasis country must have regular OMNI representation on the ground, ideally in the form of a resident representative. As suggested in the earlier discussion of OMNI operations in El Salvador, launching activities on a piecemeal basis without a permanent presence to coordinate and keep things moving does both OMNI and the host country a disservice. Continuity is essential to developing and maintaining policy dialogue and program effectiveness.

RECOMMENDATIONS

- USAID should make every effort to maintain centrally funded Cooperative Agreements with organizations such as JHU and HKI, which have proven themselves to have both the skills and reputation needed to further the micronutrient agenda, and to effectively complement the work of the OMNI FS contract.
- OMNI should be given every opportunity to succeed in the next two years, primarily by allowing it as much freedom as possible under its contract to take risks and make creative use of opportunities.
- OMNI should immediately review and finalize its emphasis country list, placing a premium on more African involvement, and then focus the bulk of its efforts on building integrated programs in those countries. No emphasis

country program should be considered without the continuity made possible by regular and dependable OMNI presence on the ground.

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IV. Future Directions for the Micronutrient Portfolio

While the portfolio review team crafted each of its individual recommendations to stand on its own, it also synthesized them all into a series of overarching recommendations as to directions it feels the micronutrient portfolio should take in both the short and long term. In doing so the team considered which activities or groups of activities would have the greatest pay-off in terms of broadening the stage for the micronutrient agenda, and increasing its potential for impact.

A. SHORT-TERM DIRECTIONS (1997-1998)

Two-year objectives are proposed in large part because the current OMNI Field Support contract and OMNI Research cooperative agreement have two years to run until their completion. This period is also seen as an opportunity to prepare the ground for the portfolio, in keeping with its potential, to take on more ambitious targets in the subsequent five-year period.

- Over the next two years USAID will maintain at least the current level of financial support for the micronutrient portfolio.

- USAID will ensure the flexibility necessary to respond effectively to micronutrient program opportunities by maintaining a mixed portfolio of contracts and cooperative agreements.

- USAID will launch a thoughtful and vigorous effort to ensure understanding of the micronutrient agenda on the part of USAID Missions, and to gain a significant level of Mission commitment to incorporating micronutrients in Strategic Plans.
- OMNI will lead an effort to prepare case studies highlighting lessons learned from notable micronutrient program experiences, especially those that have been successful in bringing supplementation and fortification initiatives to scale.
- Every effort will be made to maximize OMNI's performance during the two year period, by focusing on a manageable number of emphasis countries, allowing OMNI management greater flexibility in decision-making, and strengthening project communications activities.

Effective realization of these objectives will ensure continued, flexible funding and implementation support for micronutrient programs, bring USAID Missions more consistently on board in terms of the micronutrient agenda, provide a solid experiential base drawn from work in the past, and establish a core of integrated country programs to serve as models for the future. It will set the stage for a more far-reaching set of objectives to guide work over the five years to follow.

B. LONG-TERM DIRECTIONS (1999-2005)

In proposing long-term directions for the micronutrient portfolio, the review team thought in terms of where the portfolio should be in the year 2005. Essentially, it felt that micronutrients will by then have fully emerged as a major partner in international health and nutrition programming, supporting and supported by other sectors, accepted as a uniquely productive and cost-effective component of a balanced approach to development assistance. If these objectives are ambitious, it is because the portfolio has earned no less.

- The portfolio will evolve to a point where it places equal global emphasis, in both research and field programs, on vitamin A and iron. Other micronutrients will command a substantially more modest portion of the whole. Supplement 14, page 121, suggests funding targets for the period in question.

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- In terms of the allocation of funds, portfolio balance will be shifted until it supports, in the aggregate, 1/3 research and 2/3 field programs.
 - While retaining the flexibility to respond to compelling research opportunities wherever they occur, the major focus of operations research will be integrated within emphasis country programs.
 - By the year 2005, USAID will be supporting major national micronutrient initiatives in at least ten Joint Programming countries. Criteria for selection will include population size, prevalence of VAD and IDA, adequacy of national immunization programs, and quality and extent of public/private sector commitment.
 - A major priority of all country programs will be service to underserved populations through a locally appropriate mix of interventions.
 - In the interests both of maximizing the impact of scarce resources and ensuring complementarity of interventions, the portfolio will underline the essential role of micronutrients in reproductive health by increasing and institutionalizing linkages with family planning and MCH programs.
 - Development of working partnerships with the private sector, to take advantage of its technical, logistical and entrepreneurial expertise, will be a permanent strategic element of any initiative to promote national awareness of micronutrient issues and gain long-term acceptance of supplementation and fortification programs.

Supplement 1

(Used to develop Table 3, pages 12-13)

Allocation of Portfolio-Obligated Funds to Programs, Research and Global Advocacy				
Activity	Research	Country Programs	Global	Total
JHU Cooperative Agreement	19,900,000			19,900,000
HKI Cooperative Agreement		5,000,000		5,000,000
OMNI Research	5,100,000			5,100,000
International Eye Foundation		500,000		500,000
Florida State University	225,000			225,000
IMPACT (estimate)	2,600,000	2,600,000	2,600,000	7,800,000
PAMM		600,000	600,000	1,200,000
Peace Corps		925,000		925,000
Omni Field Support			9,919,000	9,919,000
LAC Regional		227,000		227,000
Bolivia		631,000		631,000
Ecuador		656,000		656,000
El Salvador		468,000		468,000
Guatemala		98,000		98,000
Honduras		638,000		638,000
Nicaragua		825,000		825,000
Peru		163,000		163,000
All LAC		3,706,000		3,706,000

Review of USAID's Micronutrient Portfolio

Allocation of Portfolio-Obligated Funds to Programs, Research and Global Advocacy				
Nepal 1994		1,060,000		1,060,000
Nepal 1995		200,000		200,000
Nepal 1996		816,640		816,640
Indonesia 1994		692,000		692,000
Indonesia 1995		1,607,000		1,607,000
Indonesia 1996		730,000		730,000
India 1994		350,000		350,000
India 1995		500,000		500,000
Philippines 1994		525,000		525,000
Philippines 1995		60,000		60,000
Philippines 1996		350,000		350,000
Sri Lanka 1994	130,000	130,000		260,000
Sri Lanka 1995	100,000	100,000		200,000
Sri Lanka 1996	50,000	50,000		55,000
Morocco		260,000		260,000
All Asia	235,000	7,430,640		7,665,640
Africa regional		225,000		225,000
Eritrea		150,000		150,000
Mozambique		400,000		400,000
Nigeria		400,000		400,000
Zambia		200,000		200,000

Allocation of Portfolio-Obligated Funds to Programs, Research and Global Advocacy				
All Africa		1,375,000		1375000
Total Omni Field Support	235,000	12,511,640	9919000	22,665,640
Total Obligations	28,060,000	22,136,640	13,119,000	63,315,640
Percent of Portfolio	0.4431764	0.34962357	0.2071999904	1
Percent of OMNI FS	0.010368	0.55200912	0.4376227629	1

Information used here is taken from budgets provided by OMNI in the briefing book given to the evaluation team. In some cases, these do not match allocations reported within the country program profiles provided by OMNI (Appendix H of briefing book). Additionally, the total here of \$63 million does not exactly match the \$61 million reported in the scope of the review section. The data for that section were taken from the table provided to the evaluation team within our scope of work.

Supplement 2

(Text reference, page 15)

Services and Indicators within Intermediate Results 2.1 and 3.4 ¹⁰

(1) Access to micronutrient services and products increased.

- Indicator:* At least one round of supplementation for children 1-6 years of age conducted nationwide, (or if the country's strategy is limited distribution, in high risk areas).
- Indicator:* % of children 6-72 months receiving VAC within past 6 mos.
- Indicator:* [Fortification] technology adaptation and/or field trials underway; or legislative/regulatory framework in place.
- Indicator:* Production of iodized salt initiated.
- Indicator:* % of households using iodized salt.

2) Strengthen quality of clinic-based nutrition (including micronutrient) activities and capacity of health care providers to deliver services.

- Indicator:* All government health facilities providing training, supplements and protocols.
- Indicator:* % of PHC clinics following WHO/IVACG protocols.

3) Integrate local level micronutrient planning model into child survival, MCH and reproductive health programs.

- Indicator:* Resources/line items in local budget for micronutrient in decentralized systems.

4) Integrate guidelines for monitoring and evaluating nutrition and micronutrient activities into child survival programs.

- Indicator:* Monitoring system (to assess coverage of supplements) in place.

¹⁰ Adapted from OMNI. Strategy and Implementation Plan. Revised 8/96. Johns Snow International, Arlington, VA.

- Indicator:** Monitoring system functioning for iodine levels in salt.
- Indicator:** Apply quality assurance system to strengthen management and monitoring and evaluation of food fortification activities.

Supplement 3
(Text reference page 18)

Cost and Effectiveness of Health Interventions

	Cost/Capita	Cost/DALY
EPI Plus	\$0.50-.80	\$15-30
Iron Supplements (women)	\$2.00	\$13.00
Iron Fortification	\$0.20	\$4.00
Vitamin A Supplements (<5)	\$0.50	\$9.00
Vitamin A Fortification	\$0.20	\$29.00

Supplement 4
(Text reference page 19)

Experience with the Use of Complementary Foods to Enhance Micronutrient Status

In Thailand, the rates of anemia among young children decreased from 29% in 1988 to 15% in 1991 when a village-based complementary food (generally containing fish meal which would have added needed micronutrients) was promoted throughout Thailand and the MOH distributed a processed supplementary food containing vitamins and minerals to malnourished toddlers. The prevalence of malnutrition using Thai weight-for-age growth curves among children under age five years declined as well, from 21% in 1988 to 17% in 1991 and to 12% in 1995¹¹.

The efficacy of a commercially-prepared, iron fortified complementary food in reducing anemia in infants was illustrated in a study in Beijing¹². In the Philippines, a fortified supplementary food, "Nutripak Plus," containing an iron premix and vitamin A, is used in feeding programs in health and day care centers. Previous evaluations of Nutripak without the iron showed that it resulted in reductions in malnutrition in young children. Expanded marketing of this product to *sari-sari* stores and public markets is being planned.

Chile has shown similar successes with the use of processed foods distributed to young children through health centers. When the use of heme-fortified infant cereal was assessed among older infants, the incidence of anemia was found to have decreased.¹³

¹¹ Chavasit, V. and K. Tontisirin. Thailand's experiences with fortified weaning foods, Presented at the Micronutrient Interactions in Fortified Complementary Foods and Pharmaceutical Preparations: Impact on Child Health and Nutrition. Washington, D.C. July 1996.

¹² Li Tong. Iron Deficiency in Infancy and Young Children in China. In Nestle, P. Iron Interventions for Child Survival. Proceedings of a workshop. OMNI. 1995

¹³ Combating Iron Deficiency Anemia through Food Fortification Efforts. INACG. Dec. 1990.

Supplement 5
(Text reference page 24)

Compulsory Fortification of Staple Foods	
Wheat Flour	
Iron, B1, B2, Niacin and Folate	USA, Guatemala, Honduras, El Salvador, Ecuador and Colombia
Iron, B1, B2, Niacin	Canada, Chile, Venezuela, Dominican Republic, Panama, Costa Rica, Nigeria and Saudi Arabia
Iron, B1 and Niacin	UK
Iron	Peru (legislation still not enforced)
Corn Flour	
Iron, A, B1, B2 and Niacin	Venezuela
Rice	
Iron, B1, B2 and Niacin	USA (California)
Milk	
A and D	USA, Argentina, Mexico, Honduras, Guatemala, Venezuela
A	Malaysia and Philippines
Sugar	
A	Guatemala, Honduras and El Salvador
Margarine	
A and D	Canada, Brazil, Chile, Colombia, Mexico, Honduras, Panama, Ecuador, Peru, Belgium, Netherlands, UK, Sweden, Turkey, Malaysia, Singapore and Indonesia
A	USA, El Salvador, Guatemala, Denmark, Portugal, India and Taiwan
Source: Adapted from NUTRIVIEW, 1/1996	

Supplement 6
(Text reference page 24)

Examples of Efforts from Private Sector (Without compulsory legislation)		
SUGAR	Vitamin A	<ul style="list-style-type: none"> • UNAGRO - Bolivia • Guaraní - Brazil • International Sugar Organization gave the support to UNICEF
	Iron	Portobelo-Brazil
OIL	Vitamin A (+ E)	UNILEVER - Central America and Chile
Margarine	Vitamin A	P&G - Philippines
	Vitamin A + Iron (+ other MN)	UNILEVER - Brazil
	Vitamin A (+ Betacarotene) + D	Several companies worldwide
Noodles	Vitamin A + Iron + B-Complex	Noodles Producers Association - Thailand
Milk	Vitamin A + D	Nestlé - Latin America
	Vitamin A+D+C	Several producers in Peru
	Iron	La Serenisima - Argentina
	Iron + Vitamin A + other MN	PARMALAT - Latin America
Confectionery	Vitamin A, Fe and I	M&M Mars - Brazil
Corn Starch	Vitamin A, Iron, B-Complex	<ul style="list-style-type: none"> • CPC - Central America • Alfonso Rivas - Venezuela

Review of USAID's Micronutrient Portfolio

Instant beverages	Vitamin A and C	Kraft Foods - Worldwide
	Vitamin C	Several companies worldwide
Rice	Iron and B-Complex	Tucapel - Chile Molinos - Argentina
Wheat flour, including pastas and biscuits	Iron + B-Complex	<ul style="list-style-type: none"> • Several companies in several countries • The Latin American Wheat Flour Organization gave the support to UNICEF
Pastas	Betacarotene (color + Pro-Vitamin A)	Several producers in Brazil
Liquid beverages	Betacarotene	Coca Cola (Fanta) - Thailand
Cocoa powder mixes for milk	Several micronutrients	Most producers worldwide
Snacks for children	Several micronutrients	Pepsi Co. Latin America
<p>This table is not complete, but reflects the best knowledge of Alberto Nilson on the subject. It was compiled to show some examples of the efforts being developed by the private sector.</p>		

f.



Supplement 7
(Text reference page 24)

Two Ways of Introducing Fortified Sugar in the Market		
	Compulsory Fortification (El Salvador)	Social Marketing Supported (Bolivia)
MAIN CHARACTERISTICS	<ul style="list-style-type: none"> • There are 7 sugar mills. • All the sugar is fortified by law. 	<ul style="list-style-type: none"> • There are 5 sugar mills. • The mill that launched a brand name product has a strong market presence in Santa Cruz. It is expected that the other mills will follow this initiative, if it succeeds.
THE PRODUCT	<ul style="list-style-type: none"> • The product, packaging and distribution channels remained unchanged. 	Major changes: <ul style="list-style-type: none"> • The product concept (fortified sugar). • New distribution system, new packaging. • New labeling, new brand name (registered property of the sugar mill).
IMPLEMENTATION	<ul style="list-style-type: none"> • With the support of UNICEF, PAHO, WHO, INCAP and Japan, the program started in 1990. • In 1995-96, 80% of the sugar was fortified. 	<ul style="list-style-type: none"> • The concept is supported by OMNI, UNICEF, PAHO and other agencies. • A pilot trial in ORURO (highly depressed area) in 1995 was considered a failure (distribution problems, packing not appropriate and lack of demand). • The product was re-launched in 1996 in Santa Cruz, Cochabamba and La Paz.
PUBLICITY	<ul style="list-style-type: none"> • The fortification cannot be used as a selling argument for the sugar. • Although, the label indicates that the sugar is fortified. 	<ul style="list-style-type: none"> • The product is publicized in the media, mainly TV and radio. • The investments in publicity have been US\$ 50,000 in 1995 and US\$ 75,000 in 1996 (5 months). • The cost has been shared by UNICEF, OMNI and the sugar mill.

Review of USAID's Micronutrient Portfolio

COST	Price of sugar is regulated by the government. Fortification cost is absorbed by the industry.	
REWARD FOR THE INDUSTRY	The reward for the industry is the social image.	
ACCEPTANCE BY THE CONSUMER	<ul style="list-style-type: none"> Based on an awareness campaign informing the consumer, there was no negative reaction. 	<ul style="list-style-type: none"> Some were concerned that it does not really contain Vitamin A. The store owners did not understand the need for Vitamin A and were reluctant to buy it.
CRITICAL ISSUES	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> The product was not available in Cochabamba and La Paz and in Santa Cruz it was available only in supermarkets.
STATUS	Program has reached good coverage.	Too early to assess.

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Supplement 8
(Text reference page 27)

Potential Contribution from the Private Sector	
Producers of Micronutrients	
	<ul style="list-style-type: none"> • Ensure availability of micronutrients to the food and pharmaceutical industries in adequate volume and price. • Develop and improve technologies for the fortification of foods and production of pharmaceutical dosage forms as well as collaborate in transferring the technologies to local industries, including analytical methods for Quality Assurance and Control. • Help in developing awareness on micronutrients in health authorities, health professionals, food and pharmaceutical industries, the media and the consumer (e.g., congresses, seminars, newsletters, press releases, etc.). • Contribute to applied research in improving the knowledge on the importance of the micronutrients.
Pharmaceutical Industry	
<ul style="list-style-type: none"> • Suppliers to the Health System 	<ul style="list-style-type: none"> • Supply pharmaceutical dosage forms to the Health System. • Some limited investment in developing/improving dosage forms.
<ul style="list-style-type: none"> • Producers of OTC and prescription products 	<ul style="list-style-type: none"> • Develop/improve dosage forms. • Investment in research. • Help in developing awareness of the population (health authorities, health professionals and the consumer) about the importance of micronutrients.

Food Industry	
<ul style="list-style-type: none"> • Producers of staple foods 	<ul style="list-style-type: none"> • Produce fortified staple foods. • Some limited investments in developing/improving fortification technologies.
<ul style="list-style-type: none"> • Producers of value added foods 	<ul style="list-style-type: none"> • Develop/improve technologies for fortifying foods. • Investments in research about the importance of micronutrients. • Help in developing awareness of the population about the importance of micronutrients (publicity, nutritional labeling, mailings to health professionals, participation in exhibits, etc.).
<ul style="list-style-type: none"> • Producers of foods for complementary feeding programs 	<ul style="list-style-type: none"> • Development and production of fortified foods for the complementary feeding programs (School lunch programs, foods for preschool children and pregnant women and foods for aid programs, including refugees).
Industrial Associations	
	<ul style="list-style-type: none"> • Help in developing awareness on micronutrients of health authorities, health professionals, the food and pharmaceutical industries and the consumer.

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Supplement 9
(Text reference page 31)

Levels of Nutrients and Estimated Costs of Raw Materials for Multiple Vitamins for Pregnant Women			
Nutrients*	Levels	Percent of Costs	Cost per 180 days
Vitamin A	2667 IU	14%	.19
Vitamin D	400 IU	6%	.08
B ₁	1.5 mg	1%	.02
B ₂	1.6 mg	4%	.05
B ₆	2.2 mg	3%	.04
B ₁₂	2.2 mg	4%	.05
C	70 mg	31%	.42
Niacin	17 mg	6%	.08
Zn	400 mcg	1%	.02
Iron	60 mg	27%	.37
Folate	15 mg	2%	.03
Total Cost		99%	\$1.35

* If Vitamin E (10 IU) were added, the cost would be \$1.71 for 180 days and \$2.56 for 270 days.

Supplement 10
(Text reference page 62)

Expanded List of VAD Research Topics
(Per Johns Hopkins University)

- How extensive is maternal VAD? What are the health consequences to mother, fetus and infant of maternal VAD? What supplemental and dietary measures are effective and affordable in preventing maternal VAD? How long should women receive a supplemental or dietary intervention (eg, during pregnancy and lactation, before pregnancy?)
- What indicators are most useful in assessing the public health importance of maternal vitamin A deficiency? What health and economic impact can a country expect by investing in the prevention maternal VAD?
- Does maternal VAD increase risk of mother-to-child transmission of HIV? Can improved maternal vitamin A intake and status reduce vertical transmission of HIV and, thus, offer a feasible and inexpensive approach to curbing HIV infection and associated morbidity and mortality in the developing world?
- Can high-potency vitamin A given to newborns at or shortly after birth reduce infant mortality, especially in the first six months of life? If so, what are the most efficient community mechanisms for providing vitamin A to newborns?
- What important interactions between vitamin A and other nutrients (eg, zinc, iron, iodine or protein-energy) may limit or enhance efforts to improve vitamin A status or reduce associated disease burden?
- Does vitamin A exert antagonistic or synergistic responses to vaccines? What are the underlying immune mechanisms that explain these interactions and how can they be exploited to use vitamin A for enhancing effectiveness of vaccine programs?
- Can vitamin A reduce the incidence, duration or severity of emerging infectious diseases of global public health consequence (eg, falciparum malaria, HIV/AIDS, STDs)? What are the immune mechanisms underlying
- What indicators of vitamin A status work best for different purposes, high-risk groups and conditions of use? Specifically, (1) what replicable, non-invasive or minimally invasive and low-cost field methods can be used to assess vitamin A status at individual and community levels (eg, history of night blindness during pregnancy or lactation, dark adaptometry, blood spot, histological or micro-immunological techniques)? (2) Which measures of vitamin A status can best

serve as "gold standards" (eg. serum retinol, relative dose response, stable isotope estimation of body VA stores) against which field indicators may be evaluated? (3) How does infection interfere with interpretation of indicator data? (4) What standard cutoffs for indicators represent thresholds of risk for VAD, and its health consequences, as a public health problem?

- What is the bioavailability of provitamin A carotenoids in common vegetables and fruits as consumed by poor people in developing countries? What aspects of food transport, storage and preparation, and dietary mix, can promote or inhibit provitamin A bioavailability? How can the bioavailability of provitamin A carotenoids be expected to vary by vitamin A status of a population?
- What specific types and levels of dietary interventions can improve vitamin A status and associated health outcomes? What elements of child feeding and child care behavior should nutrition education address to improve dietary vitamin A intake by young children in the home?
- Which combinations of dietary interventions should be promoted in poor, rural cultures, where provitamin A sources are dominant, to control VAD as a public health problem? What are the obstacles to scaling-up different dietary interventions? Can established dietary guidelines, which vary considerably among cultures, be effectively used to set intake goals and monitor interventions?
- Which dietary assessment methods are most practical, yet informative, for estimating in individuals and communities usual vitamin A intake levels, the prevalence of inadequate intake, and dietary responses to interventions (ie, program impact)? How can the accuracy and representativeness of food composition data on vitamin A and provitamin A carotenoid content be improved and adapted for wider use in dietary assessment and program evaluation?
- What design and implementation factors sustain, increase or decrease coverage of target groups in national vitamin A supplement distribution programs? Specifically, do national campaigns or locally managed distribution schedules work best, and under what conditions? What national, provincial, local and household factors influence availability and flow of supplies, receipt by target groups, costs, and community compliance with distribution programs (medical, targeted or universal)? How can program monitoring and training be used most effectively at low cost to sustain adequate coverage?
- How well do different vitamin A interventions (eg, supplementation, fortification and dietary efforts) converge in high-risk populations? What criteria could be developed and applied to assess levels of program overlap that, in fact, may represent levels of complementarity, "safety-netting" or redundancy? It may be

argued that the last represents the only level of overlap that justifies program cutbacks.

Supplement 11
(Text reference page 63)

Detailed Recommendation on Proposed Research to Develop New Vitamin A Status Assessment Methods

USAID should initiate a new program of research to develop a simple, robust field method for the measurement of vitamin A status FROM finger prick samples of blood.

The main use of the method would be within large-scale population surveys of the prevalence of vitamin A deficiency. The aim would be, therefore, that the new method should be robust, able to be carried out at the place where the sample is taken by someone with no (or very minimal) laboratory training, and without the need for electricity. Each test should cost no more than the recurrent cost for an analysis of serum retinol using high performance liquid chromatography (HPLC) (preferably much less), and should be suitable for mass production.

For these purposes, although the results should not be systematically biased, the precision of the estimate within each individual does not need to be extremely good (e.g., $\pm 0.1 \mu\text{mol/L}$ might be adequate). Various technological approaches could be used to achieve this objective (e.g., immunochromatography, ELISA [dip stick], etc.).

USAID should consider asking one or more technological development groups with a good track record for the development of such technologies to prepare a product development proposal, and then consider awarding a cooperative agreement or contract for this work. It will be important to specify the user requirements for the product (in much more detail than outlined above) during the development of the request for proposals.

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Supplement 12
(Text reference page 70)

**Research Grants Provided through the OMNI Research Cooperative
Agreement with ILSI (to October 1996)**

Topics	No. rec'd	No. funded
1. Quality assurance control systems for vitamin A, iron and iodine fortified foods	36	2
2. Development and validation of methods for micronutrient (iodine, iron, vitamin A) assessment of communities	61	4
3. Development of strategies to increase and test bioavailability of vitamin A and iron from diets	42	4
4. Effective communications to resolve micronutrient deficiencies	67	3
5. Assessing costs of micronutrient interventions	22	0
6. Development of improved delivery systems for iron supplements	33	4
7. Development of improved field methods for testing micronutrients in fortified foods	12	1
8. Development of improved methods for processing and packaging fortified complementary/weaning foods	22	0
9. Resolving micronutrient deficiencies: a women-centered approach	91	5
10. Unsolicited proposals	42	0*

* Six proposals still under consideration.

Supplement 13
(Text reference page 80)

Evaluation of the Impact of Micronutrient Control Programs

A series of randomized controlled field trials have shown that, in populations where VAD is an important public health problem, increasing the intake of vitamin A among young children aged 6 to 59 months will substantially reduce their risk of death; probably by anything from 1 to 40%, with the most likely impact being a 23% reduction (Beaton *et al* 1993). It is therefore reasonable to assume that a program which takes place in a population where VAD is an important public health problem, and which substantially increases the intake of vitamin A by a high proportion of young children (including those children most at risk of VAD—i.e., the poor) will have an important impact on mortality. These trials were expensive and logistically difficult undertakings, and a major part of their expense and difficulty stemmed from the need to collect accurate and complete mortality data. Accurate and complete mortality data is essential to such mortality impact studies, otherwise erroneous impact results will be obtained.

Similarly, epidemiological studies have shown that severe IDA in pregnancy increases the chance of both the woman and her child dying. It is thought that mild-moderate IDA in pregnancy may increase the risks of dying in both woman and child, though to a smaller degree. Although proof of the latter is lacking, this should not be the role of routine programs. The only conclusive way to study such issues is through well-conducted, randomized controlled field trials.

For a micronutrient deficiency control program to achieve a substantial increase in the intake of the micronutrient by a high proportion of the target group (e.g., young children, pregnant women) it will need to be effectively delivered and have a high coverage. This should lead to improvements in both the mean micronutrient status and the proportion deficient among the target group.

The main focus for the monitoring and evaluation of the impact of all micronutrient deficiency control programs should therefore be on the accurate assessment of program coverage (proportion of target group who have received the intervention) and effectiveness (made up of the adequacy of the intervention received, and its effects on micronutrient status of the target group).

For example, in a four-monthly high dose vitamin A supplementation program, the program should institute periodic (e.g., annual) assessments of the proportion

of children aged 1 to 4 years who have received one, two, or three supplements within the past 4, 6, 8, 10, 12 months. This gives an estimate of coverage. If possible, this should be broken down by key subgroups of the population (e.g., rural/urban, rich/poor). The program should also assess a small number of the supplements at point of delivery for potency (say two randomly chosen doses from each district of the country per year). This gives an estimate of adequacy. Finally, it should make periodic assessments (e.g., once every five years) of the vitamin A status of the target group. This gives a measure of program effectiveness. If the vitamin A status of the target group has improved, one can safely assume that this will have led to a reduction in mortality in the target group, based on the results of the earlier randomized controlled trials. However, any change in vitamin A status might have also been influenced by other extraneous factors, such as economic, political or climatic changes which have led to dietary improvements, or the introduction of a fortified food. From a knowledge of the coverage of the supplementation program, its adequacy, and the scale of other potential extraneous factors, the program managers will be able to make a judgment of whether the supplementation program is likely to have played a substantial or trivial part in any change which has occurred. Based on this judgment, they will be able to make a plausibility statement on the likely impact of the supplementation program on the vitamin A status and hence on mortality in the target group.

In some cases, where it has been shown that there was good coverage, high adequacy, and evidence of an effect on micronutrient status, it may be worth going on to examine any available mortality data (e.g., from periodic surveys or censuses conducted by other programs) to see whether the trends in mortality in the target population appear to have been in the correct direction, whether the rate of any decline increased after the program reached a moderate-to-high coverage, and whether the changes in the rates of decline were greater in populations where the program was active (at all, or relative to other program areas). Again, after considering other potential reasons for any trends observed, the program will be able to make a more detailed plausibility statement about the likely impact of the program on mortality.

Supplement 14
(Text reference page 90)

Five Year Funding Targets
1999-2004

	Research		Program
Vitamin A	40%		50-60%
Iron	40%		30-40%
Zinc	10%	}	
Other	10%		10%

Annexes

Annex A. Country Reports

BANGLADESH

VISIT TO BANGLADESH, NOVEMBER 2-9, 1996

BY: DR. RAINER GROSS AND NANCY TORREY

RAPPORTEUR: RAINER GROSS

The rapporteur participated in a mission to Bangladesh to evaluate the micronutrient program sponsored by USAID. It was the objective to observe particularly the **service delivery of micronutrient programs**.

The strategy and quality of service delivery of the micronutrient program will be discussed on the basis of the following indicators: acceptability, effectiveness, efficiency, sustainability, and reproducibility.

All of the three intervention strategies (supplementation, fortification, and dietary intervention) require changes in practices and behavior. Therefore, measures on information, education, and communication are an essential element of micronutrient programs. However, it was not the objective of this report to analyze the situation of behavioral changes.

A. VITAMIN A DEFICIENCY

In Bangladesh there are two strategies followed to reduce vitamin A deficiencies: 1) dietary improvement through home gardening; and 2) vitamin A capsule distribution. Although some years ago fortification of wheat flour was discussed, this alternative was finally turned down with the argument that at that time nearly all wheat had to be imported and therefore the program would depend too much on external factors. Food fortification is being discussed again, but informally and without a cohesive forum.

Since 1973, yearly, vitamin A capsule distribution was financed by several agencies. However, only between 30% and 50% of the population was covered by supplementation. Helen Keller International (HKI) supports the vitamin A supplementation program through its Nutritional Surveillance Program, funded primarily by USAID. After support from the World Bank began in 1993, the

coverage rate of supplementation among children one to five years has reached nearly 80%. No difference has been found between boys and girls. The dramatic increase has been achieved as a result of capsule distribution during National Immunization Day when children received their polio vaccination. The financial support for the capsules from the World Bank will finish at the end of this year. However, the World Bank feels committed to guarantee the continuation of the program and has approached Overseas Development Administration (ODA) for funding the supplementation program in 1997. The World Bank will resume funding for the capsules in 1998.

Besides supplementation, the change of dietary behavior is the major strategy that is supported by USAID to reduce vitamin A deficiency in Bangladesh. HKI manages a NGO Gardening, Nutritional Education and Surveillance Project (NGNESP), subproject under G/PHN Vitamin A for Health Project (HRN-5116-A-00-2045-00), which promotes the production of vegetables and fruits in home gardens of poor rural households to increase the availability and consumption of carotene rich foods.

1. Acceptability

a. Institutional Acceptability

All interviewed representatives of different national and international institutions and organizations appreciated and esteemed highly the work of the home gardening project. It is seen as an important contribution for household food security and vitamin supply of the poor. The cooperation and working relationship with several institutions, and in particular the increased demand of collaboration from NGOs, is testimony to the high acceptability of the project.

b. Financial Input

NGNESP receives support from several donors. However, the largest financial support comes from USAID/Washington and USAID/Dhaka. In 1995, two-thirds of NGNESP funds came from USAID/Washington and one third from other sources. This year about 40 percent of the funds originated from USAID/Washington, 40 percent from USAID/Dhaka, and 20 percent from other donors. Thirteen local NGOs receive financial contributions from HKI for training, setting up nurseries, and extension work. These contributions are relatively small compared to the total budget of the local NGOs and the specific budget they provide for the home garden program.

c. Community Participation and Compliance

There are three indicators for community participation and compliance: 1) type of garden (traditional garden, improved garden, developed garden); 2) number of varieties grown in the homestead garden; and 3) self-monitoring and

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problem-solving actions of the home gardener. NGNESP counts success when families establish and maintain a year-round developed garden with at least six different varieties of fruits and vegetables.

d. Coverage

In 1996, the NGNESP reaches through NGOs in 90 districts (20% of all districts) about two million inhabitants (1.6% of the population).

2. Effectiveness

HKI took an exemplary initiative to monitor and evaluate the output and outcome of the project over the past seven years. In addition to this documentation, there are some indications that home gardening has a positive impact on vitamin A status. However, more operational research is needed to obtain more hard facts and to understand better the impact of the home gardening program. The need for further research has been acknowledged by USAID who has agreed to finance a research project on the impact of home gardening in Bangladesh. The project will be conducted by the International Center for Diarrheal Disease Research/ Bangladesh (ICDDR,B) and HKI. However, it may well be that home gardening shows a higher impact on increase of energy intake (household food security) than on improving vitamin A status. An improved vitamin A status by increased vegetable and fruit consumption can only be expected if oil and fat consumption is increased as well as if prevalence of parasitic diseases is reduced. The research will consider these two factors even though the project has not been particularly concerned with them.

Additionally, data collected from the surveillance program are analyzed currently to obtain more detailed information on the effectiveness of the home gardening program such as intra-household distribution of vegetables. Complementary qualitative research should be conducted on nutrition behavior changes.

3. Efficiency

“According to a recent assessment [of Grainer in 1993] of programmes in Bangladesh, supplement programmes are not less costly than food production strategies” (FAO, 1996). However, information about costs alone does not allow for conclusions to be drawn as long as they cannot be related to program effects. Since there are not yet enough quantitative results on the health impact of NGNESP, it is not possible to provide information on the efficiency of the program.

4. Sustainability

At the current stage, adequate seed production—in quantity and quality—is crucial to secure a sustainable expansion of the program. It is estimated that about only three percent of foundation vegetable seeds are produced in Bangladesh. To overcome shortcomings, HKI is currently involved in the promotion of sufficient, local certified seed production by NGOs. In fact, quality seed production at the “thana” (regional) level on down to the local village nursery level is a major component of the NGNESP.

Additionally, as vegetable production increases, more and more farmers will seek to sell their products. Therefore, marketing will need to be supported from the project side in the future.

NGOs are the pillar of the implementation of the home gardening project in Bangladesh. To secure their survival in times of decreasing external support, large NGOs count on their strength as enterprises and are therefore running businesses. Smaller NGOs see their organizational future in centers that earn their money by providing services.

There is consensus that dietary change projects need time for showing their effectiveness. As a result, long-term funding commitments from supporting international agencies are needed before the implementation of project activities. Otherwise, cooperating partner institutions in projects suffer from the permanent risk of not being supported long enough, and therefore not reaching the “point-of-no-return” for sustainable project development without external support.

5. Reproducibility

HKI envisions three areas of expansion for NGNESP: 1) increase of the coverage in existing districts; 2) expansion to 50 districts through NGOs and Department of Agriculture Extension Service; and 3) expansion to peri-urban and urban areas. The current model can be used in new districts and existing experience has shown that most program elements are replicable. In case strategies need to be corrected, the system is flexible enough to respond rapidly. The increase of coverage in existing districts provides the chance of new innovations and specialization.

B. IRON DEFICIENCY

It is estimated that approximately 70 percent of the mothers and children of Bangladesh suffer from severe nutrient deficiency anemia (Hb < 80g/L). According to the findings from the ICDDR,B in Matlab about 25 percent of maternal deaths are associated with anemia and hemorrhage. Despite the fact that it is recognized that anemia is a major public health problem in Bangladesh there is no ongoing iron deficiency intervention program. The World Bank is funding a new program, the “Bangladesh Integrated Nutrition Program” in which it has

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proposed, among other objectives, to reduce the iron deficiency anemia among children and pregnant and lactating women by one-third. The planned intervention program is based on iron and folate supplementation.

ICDDR,B and Helen Keller had formulated two research applications for operational research on iron supplementation. The proposals did not consider newer results on weekly administration of iron supplementation.

C. IODINE DEFICIENCY DISORDER

Approximately 70 percent of the Bangladesh population suffers from IDD. A salt iodination program has been financed by UNICEF for the past three years. The program has emphasized technological changes in production but not consumer awareness, since it was assumed that once all producers iodize their salt consumers would have no product choice. However, due to imports of uniodized salt and the large number of small producers in Bangladesh who do not iodize their salt, many people opt for the cheaper uniodized salt. Meanwhile, according to UNICEF, 93% of the salt is produced by the seven largest salt producers and 42% of salt in households is iodized.

NEPAL

In Nepal, the vitamin A program is implemented by supplementation, home gardening, and nutritional education. The supplementation and education program is carried out mainly by the Ministry of Health through female community health volunteers and the home gardening program through NGOs. The supplements are distributed throughout a campaign twice a year. Whereas the distribution is completely taken over by the Ministry of Health, the promotion is still supported by HKI. There are several other activities such as in food preservation (e.g., solar drying). Furthermore, HKI assists in monitoring of the supplementation program. Up to now, HKI has not been involved in operational research.

A. VITAMIN A DEFICIENCY

1. Acceptability

a. Institutional Cooperation

The program's multisectorial scope of activities collaborates with several international and national institutions and organizations. The supplementation and nutrition education is completely integrated into the primary health system of the Ministry of Health. For assuring better community participation and an integrated approach of the vitamin A program, it was felt that NGOs are better facilitators for the home gardening project than the governmental organizations like the Ministry of Agriculture. The home gardening program works currently in two districts with two NGOs. However, the question remains why nutrition education and home gardening has not been implemented as well by the same NGOs. UNICEF is looking at fortification and studies on nutritional impact.

b. Financial Input

UNICEF is providing the vitamin A capsules and cofinancing the nutrition education program.

c. Coverage

The capsule distribution is carried out completely by the Ministry of Health. The coverage rate of the supplementation program of the 32 HKI districts is 87%. More than twice as many home gardens were developed in the first year than were expected in the two program districts.

2. Effectiveness

According to the preliminary results of a study, practically all mothers (99%) wanted to receive a capsule in the next campaign. More than 50% of the mothers thought that vitamin A is beneficial for their health, and 43% of mothers identified vitamin A rich food. Furthermore, of children who had received a supplement, 46% consumed more vitamin A rich food than those who did not receive the capsule. There are not yet reliable data available on the effectiveness of the supplementation program regarding the vitamin A status. However, there is some information available from some districts, but there is no commitment for implementing an impact survey. There is a baseline available with more than 19,000 individuals which could be used for an impact study.

3. Efficiency

Since there are no data available on the effectiveness of the program nothing can be said about efficiency. There are some cost estimations about supplementation (\$US .14 per capsule per child), however, the program is working on a detailed cost analysis of supplementation per child and establishment of one home garden.

4. Sustainability

The distribution of supplements is completely in the system. The success of the vitamin A capsule campaign is based on the empowerment of the volunteer health workers. The program is very much consolidated by educational measures and social marketing strategies. However, the purchase of capsules, the material for nutritional education, and service delivery monitoring will still need external support for some years since neither the government nor the families will be able to finance the capsules. Due to the early stage of the home gardening program there are no clear ideas about how to make the program organizational and economically sustainable. However, it is felt that in the future the home gardening program should have a linkage with the Ministry of Agriculture.

B. IODINE DEFICIENCY

The IDD program is based on salt iodization. The salt is mainly imported from India. However, little is known about the effectiveness of the program.

C. IRON DEFICIENCY

Iron supplementation for pregnant women is the responsibility of the health sector, however, there is little effectiveness. HKI has some plans to support the governmental program.

RECOMMENDATIONS

1. Research

Internationally, there is a common conviction that the most sustainable and healthiest way to reduce vitamin A deficiency is by increasing the dietary vitamin A intake. However, there are hardly any large-scale experiences on operational research of dietary intervention programs. Considering that: the number and relationships of factors that influence dietary intervention programs is far higher than in fortification or supplementation programs; the HKI NGNESP in Bangladesh offers a unique opportunity for a systematic and integrated research program from plant breeding to health and poverty impact; and the HKI Nutritional Surveillance Project (NSP) generates continuously representative data on the nutritional situation in Bangladesh, it is recommended to concentrate the research more on dietary intervention in Bangladesh.

On the basis of holding an international workshop, a comprehensive and efficient research plan could be developed for research topics and cross-cutting issues. The results of the workshop could set the stage for the application of a research program proposal and forming a research network. To establish a continuous link between scientific research and practical application, the network should be coordinated by an implementing institution such as HKI. The installation of such a research center could attract additional institutions to provide financial support and scientific expertise.

Based on the ongoing work in Bangladesh, the following types of research issues could be addressed to the proposed dietary vitamin A research network:

- program effectiveness of dietary programs related to intra-household food distribution (e.g., gender, age groups)
- contribution of other food such as oil seeds (e.g., soybean, ground nuts, sunflower seeds) to enhance bioavailability of carotenes
- effectiveness of home gardens within an integrated small-holder agricultural production system

- role of small livestock production and aquaculture relating to micronutrient status
- positive side effects of dietary programs other than improved vitamin A status (e.g., other nutrients, energy, income, environmental impact, empowerment)
- productivity and acceptance of high-micronutrient vegetable varieties (e.g., carotene rich carrots or tomatoes) in the home gardening project
- interaction between dietary intervention and supplementation program.

Additionally, the following recommendations should be considered in research:

- include dissemination and advocacy of research results into research projects, in particular at the national level
- stimulate quantitative and qualitative research on behavioral changes and social marketing
- inspect and simplify procedures for research applications (e.g., why countries were included for applications in which local USAID representation denied nutrition as development priority).

2. Program Strategy

HKI starts to expand their activities to reduce iron supplementation (adolescents and female workers). Considering the magnitude and severity of anemia in Bangladesh it is suggested that USAID should secure future support of this important intervention. The iron supplementation proposal HKI still works on is the old approach of daily administration of iron tablets. However, most countries explore the effectiveness and efficiency of weekly dosing. Considering that in the regional HKI office, an iron supplementation program with female adolescents was started on the basis of weekly dosing, it is recommended that both offices harmonize their operational research surveys.

The severe anemia problem in Bangladesh could lead to the suggestion of iron fortification. However, experiences in Bangladesh have shown that due to the compliance of the many national food companies and the dependency on imported products, countries normally show low effectivity in iron fortification. Furthermore, there is an increased concern of possible negative side effects of an indiscriminate utilization of iron fortification. As a result, in addition to dietary interventions, targeted supplementation and fortification (e.g., infant food) should be given priority.

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The NSP should be utilized for a systematic surveillance of the micronutrient situation to assess the impact of monitoring of programs in Bangladesh. In particular, anemia and IDD should be monitored routinely.

The experiences in Bangladesh and Nepal have clearly proven that national campaigns for supplementation (although, often verticalism discriminates) are more effective and probably efficient than the integration into a routine health service. The vitamin A capsule program will need to be continued for the next years in both countries until a greater contribution of dietary vitamin A can be proven.

The dietary intervention program is based mainly on the increased consumption of vegetables. However, there are other options for the rural populations such as small livestock that could be considered for consumption. Furthermore, vegetable-based dietary intervention programs, increased oil and/or fat consumption, and a reduction of parasitic diseases must be considered.

There is more room for operational research and monitoring on behavior changes and development of social marketing strategies. For example, there are hardly any qualitative studies available on food behavior and on educational material development. It seems that the project's countries need more professional support. Therefore, it is recommended that each country program receives consultancy from an internationally acknowledged institution.

ACKNOWLEDGMENTS

The rapporteur thanks the HKI team leader and his staff and all interviewed persons in Bangladesh for their kind and patient assistance. Furthermore, he would like to express his gratefulness for the hospitality of the Bangladeshi home garden farmers that showed their work with dedication and pride. Finally, thanks for the supportive professional collaboration of team member, Dr. Nancy Torrey.

BOLIVIA

OCTOBER 28 - NOVEMBER 1, 1996

RAPORTEURS: ALBERTO NILSON AND SANDRA HUFFMAN

A. RECOMMENDATIONS FOR MICRONUTRIENT ACTIVITIES IN BOLIVIA

- 1) Need to write up the results of the vitamin A experience and the iodine experience into case studies because there were lessons learned that could help other countries.
- 2) Investigate cost effectiveness of providing vitamin/mineral supplements for pregnant women not only iron/folate.
- 3) Need for clear guidelines on the steps needed in developing fortification programs, including food consumption patterns and suitability of different foods for multiple fortification.
- 4) Need for a follow-up evaluation of vitamin A to assess the impact of the program which would include: 1) an assessment of the food consumption patterns (including sugar, wheat, bread, pasta); 2) coverage of vitamin A supplements among children under five years and among postpartum women; and 3) serve as a baseline for the iron fortification program.
- 5) Investigate problems in the marketing of Vitazucar, including, if feasible, the use of a local consultant familiar with distribution of staple foods, marketing, and sales of such products.
- 6) It will be important to conduct a public relations campaign explaining about the importance of fortification with micronutrients prior to the beginning of the flour fortification. This is especially true because of the political nature of the activity. If there is not broad understanding of the need for fortification, then there can be a negative backlash on the program unless there is wide support, especially by the academic and health communities so it is not seen only as a political issue of this government.

- 7) Assess the feasibility of the marketing of a fortified complementary food for children aged six months to 24 months (such as *api*).

1. Needs For Support

During the visit the following needs for support were identified:

- Quality control
 - ▶ Systems
 - ▶ Analytical methods
- Technical advice for food fortification
 - ▶ What foods could be fortified at what levels
 - ▶ Costs
 - ▶ Possible multiple fortification with both iron and vitamin A
- Exchange of experiences with other countries. Maybe, potential role of IVACG and INACG, or OMNI at the next Latin American Congress of Nutrition in Guatemala in 1997.
- Education of professionals
- Cheaper and easier systems for determination of vitamin A in blood.

2. Main Characteristics Of Bolivia

Average illiteracy is around 23%. In some communities the illiteracy is up to 70%. Seventy percent of the Bolivian population is indigenous. Fifteen percent is monolingual. In some other communities up to 70% of the population is monolingual (Mainly Quechua and Aymar ).

3. Nutritional Status

There is one biochemical study evaluating the situation for vitamin A nationwide in children under five years old. The key results are

< 10 mcg/dl	0.1 % severe
< 20 mcg/dl	11.3 % marginal
< 30 mcg/dl	48.3 %

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The same study reports the intake of vitamin A and other micronutrients. The main results are:

FIGURE 1. THE INTAKE OF VITAMIN A AND OTHER MICRONUTRIENTS

	% of RDAs	
	Family	Children 12-60 months
Calories	69	69
Proteins	105	113
Calcium	44	56
Iron	142	143
Vitamin A	62	81
Vitamin B ₁	83	86
Vitamin B ₂	78	98
Niacin	88	83
Vitamin C	103	100

Vitamin C can be a problem in some isolated, rural areas. A 44% adequacy was found in Altiplano and 60% adequacy in Llanos, both isolated and rural areas. (Source: Encuesta de Vitamina A y Encuesta de Consumo: Areas Deprimidas, Bolivia, 1991)

A second study confirms the above findings:

FIGURE 2. MICRONUTRIENT STUDY¹

	Intake adequation in families, %
Calcium	62
Iron	141
Vitamin A	46.7
Vitamin B1	64.7
Vitamin B2	71.4
Niacin	74.8
Vitamin C	18.1

The prevalence of anemia in pregnant women is 50.5%. The problem may be aggravated by intestinal parasitism, especially hookworm. However, there is not an evaluation about the seriousness of this problem. Consequently, no action is being taken.

¹Source: Encuesta de Seguimiento del Consumo de Alimentos, Departamento de La Paz, Area Rural, 1994

During the visit we did not get information on the prevalence of anemia in children. We did not get information about the nutritional status for other micronutrients.

a. Supplementation with Vitamin A

The supplementation program considers the distribution of 1.5 million capsules/year. There are two national distribution campaigns combined with the vaccination campaigns. Furthermore, the Health Care System distributes capsules to the children attending sick or well child visits. The target age group is children one to five years old and mothers immediately postpartum.

The program started in 1989. In 1991 the baseline was developed, showing a prevalence of 11% of children below 20 mcg/dl (after the program had been in operation for two years). No further evaluations of the impact have been made. The capsules are donated by UNICEF. There is no information on the cost of distribution of the capsules, however the immunization campaign has been estimated at more than \$1 million each round.

About 67% of the population live within one hour of a health center or post, but more than 60% of children under five years old do not utilize the health care system.

In some cases there have been children getting up to nine capsules per year because some mothers try to obtain more than one capsule during the campaign, thinking that if one is good, more are better. In addition, sick children also received capsules when they are seen at a health center and well children are also given capsules during growth monitoring and well child visits. At this time mass communication efforts encourage mothers to bring infants and their brothers and sisters under five years of age to receive vitamin A capsules.

It is not clear whether once the fortification starts, the supplementation program will be reduced to those in the population not receiving enough fortified sugar.

b. Supplementation with Iron

There is a supplementation with ferrous sulfate plus folic acid (60 mg Fe and 250 mcgm of folic acid for pregnant women) expected to be started after the third month of pregnancy. Due to discomfort some women quit the program. Also, there is not enough information provided to the mother about why they should take the supplement (lack of motivation). Furthermore, the health system has a low coverage of pregnancy and has logistical problems, making the supplement unavailable at times.

It is estimated that only 14 percent of pregnant women receive the supplement (OMNI summary). The Mothercare and OMNI projects will use promoters and

nurse auxiliaries to encourage consumption of iron supplements among pregnant women mostly within CCH areas. There is a suggestion by the interagency group to start the supplementation of children under two years old, using iron syrups or drops.

c. Food Fortification

There is not adequate data on the food habits of the population, making the process of selection of vehicles (basic staples or other foods) for micronutrients.

The following foods have been identified as good carriers:

- Salt: iodine and fluoride
- Sugar: vitamin A
- Wheat flour: iron, vitamin B₁, B₂, niacin, and folate.

There are still doubts about the best iron source (reduced iron or ferrous sulfate) for wheat fortification.

Selection of the vehicles: It is not clear how these vehicles were selected because there are no adequate representative data on food consumption patterns. There is a proposal for a presidential decree on wheat flour fortification that is expected to be signed before December when the First Ladies Summit will be held in Santa Cruz, Bolivia. Also the MOH has drafted legislation for the fortification of sugar but this has been postponed waiting for the outcome of the sugar fortification pilot project.

4. Integration

There is no integrated plan on micronutrients. PAHO is acting as coordinator of the activities of different international agencies and the government. Politically speaking it is bad to say that there are deficiencies.

a. Success Story

Thanks to salt iodization the country has been able to reduce goiter prevalence to the following:

1983	65% of the population
1989	21% of school children
1994	4.5% of children 8-10 years old

Some key factors for success were:

- Adequate investment (over \$4 million) from the Italian government
- Control of fortification (monitoring)
- Awareness of the consumer
- Legislation
- Government seal of approval

Today, UNICEF considers that less than two percent of the salt is not fortified. UNICEF still supports the project at a level of \$30,000 for the monitoring, but it is expected that the municipalities could pick up this cost (at an average of \$100 per municipality).

5. Oral Rehydration Therapy (ORT)

There was some success in the development of the market for ORS. The product can be found in pharmacies. However, the price is high, not being affordable by the poor people. The health system is trying to cover the rest of the population, however, the coverage of the health system is not great. The product must be imported as, due to economies of scale, the local industry is not competitive for producing the ORS. Therefore, much of the ORS is purchased from Mexico. The same is true for ferrous sulfate which could be produced in Bolivia, but would cost more than those now purchased by UNICEF from Sweden.

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6. Awareness Of Key Sectors In Micronutrients

FIGURE 3. KEY SECTORS IN MICRONUTRIENTS

Health Authorities and NGOs	<i>High</i>
Academic Sector	<i>Low.</i> Santa Cruz University, Dept. of Food Technology is working on stability of fortified wheat flour.
Health Professionals	<i>Low.</i> They do not prescribe supplements actively, because: <ul style="list-style-type: none"> • Balanced diet is enough. • If the mother does not ask, then the physician does not prescribe (placebo concept). • Patients can not afford the supplement.
Media	<i>Low.</i> Only used as vehicle for publicity for fortified sugar but not about importance of micronutrients or need for fortification.
Food Industry	Only wheat flour and sugar mills are partly aware of need for fortification.
Pharmaceutical Industry	Not assessed.
Consumer	<i>Low,</i> with the exception of salt with iodine. The awareness of the existence of the fortified sugar is growing.

Consequently, there is little or no collaboration from the sectors showing low awareness.

a. International Agencies

The agencies working on micronutrients are: PAHO, UNICEF, World Food Programme (WFP), OMNI, Mothercare, BASICS and Corporation for Community Health (CCH). PAHO gives priority to iron and UNICEF to iodine.

7. Wheat Flour Mills

There are a total of 19 mills; eight represent 80 percent of the total flour production. Eighty percent of the flour produced in the mills go to bread production. Additionally, there are two important pasta producers with their own mills.

There is not enough information about the intake of wheat products in different segments of the population. The mills are aware about the problem and are willing to collaborate. The key factors for the positive attitude mentioned are:

- Awareness about the importance of the problem.
- They have ownership of the project.
- Possibilities to develop barriers to the contraband. The mills consider that 20 percent of the flour is smuggled. The official evaluation shows only five percent.
- The mills request that all the flour be fortified.

The wheat flour association made all the stability tests with the premix containing vitamin B₁, B₂, niacin, folate and reduced iron without finding any problem. However, the premix containing ferrous sulfate showed the development of spots in the Peckart test.

8. Sugar Fortification

There are four mills in Santa Cruz and one in Tarija. The production is around 7.5 million qq/year. All the mills are about the same size. UNAGRO has a market share of 25% in Santa Cruz, 5% in La Paz, and 2% in Oruro.

a. Sugar Fortification in Oruro

The main reasons identified during the visit for the failure of the program in Oruro are:

- Wrong packaging size.
- UNAGRO has a low market share in Oruro (with poor distribution system).
- Price significantly higher than the nonfortified sugar.

b. New Sugar Fortification Program

The preliminary evaluation shows a very good result in Santa Cruz, but low presence of fortified sugar in La Paz and Cochabamba. The MOH monitoring system showed that about 50 percent of the population was aware of the product, but so far nearly 2,000 qq have been sold in two months, with about 80 percent sold in Santa Cruz.

UNAGRO has invested about \$15,000 (they report) in publicity in Santa Cruz. OMNI and UNICEF each have put in \$30,000 for the six-month publicity campaign.

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UNAGRO has successfully implemented the fortification technology. The target level is 15 mcgm retinol equivalents per gram of sugar, and the average content of vitamin A of the sugar at the time of production is 16.47 mcgm/gm with a minimum of 13.14 and a maximum of 18.62. UNAGRO reported a loss of about 20 percent after one month of storage in the sugar plant.

Discussions with the distributors of the product in Oruro for the last year and with the distributor for Santa Cruz for this new project illustrated some distribution problems. The system works as follows:

- 1) Mill produces sugar packed in 46 kg bags.
- 2) Kholvy packs the sugar in packages of different sizes (5 kg, 1 kg, ½ kg) in the town outside the mill (Mineros).
- 3) The packages of sugar are then distributed to the three different distributors located in Santa Cruz (Disgebol), La Paz (Cresspo), and Cochabamba. This differs from how other sugar is distributed—where 18 distributors in Santa Cruz alone distribute sugar. The sugar mills do little sales outside of their offices since the distributors procure the product directly from the mill. In Cochabamba, 40 percent of the sugar is sold through small individual truck owners who bring cement and other materials to Santa Cruz and return with sugar that they then distribute.
- 4) The distributors then sell Vitazucar to markets, supermarkets, small stores, and street vendors. In the stores sugar is generally sold in bulk not in plastic bags like Vitazucar is now sold. But if Vitazucar were sold in quintales, there would be no security that the bags would be replaced, or not replaced with nonfortified sugar.
- 5) Disgebol has five salesmen dedicated to selling Vitazucar. It should be noted that Vitazucar is the only food product which Disgebol sells that vendors in these areas do not have previous experience with.

Some of the experiences they have had with Vitazucar are the following:

- 1) Some in Oruro thought that the sugar would cause women to be sterile.
- 2) Some were concerned that it does not really contain vitamin A.
- 3) The quality of the plastic bag is poor, causing breakages and label smudging.
- 4) Concern that the sugar would taste different and/or not be as sweet.
- 5) The store owners did not understand the need for vitamin A and thus they were reluctant to buy it.
- 6) Many reported that they did not have access to Vitazucar.
- 7) The distributor reported that there was a need for more point of sales materials and incentives for the store owners, such as free samples of Vitazucar.

All interviewed said that a small variation in the price has a big effect on demand (no price elasticity). Since the demand for the product has been so low, there may

be other reasons as well. This needs to be assessed in a future evaluation of the impact of the communication program.

One problem that UNAGRO reported was that UNICEF is encouraging other sugar mills to begin fortification without informing others in the vitamin A arena (including OMNI and UNAGRO).

9. Complementary Feeding Programs

There are complementary feeding programs for school and pre-school children. These programs could be a good vehicle for targeting nutrients. Foods used are generally not fortified.

a. VITAL - OMNI

There was a gap of activities during which OMNI was deciding on whether to work in Bolivia.

b. OMNI's Role

Mobilizing experts. Part of the support of OMNI is a little bit too academic—away from the reality. This need for perfection delays the action. There was good mobilization of some experts to assist in some situations (O. Dary), while some of the experts were considered to be not appropriate and too pushy.

The Mission has to allocate resources and it is very likely that, without OMNI, the allocation of resources to micronutrients would have been null. Micronutrients themselves are not a priority and the package has not been properly wrapped up to become a priority. The curative approach is preferred over the preventive approach. Furthermore, OMNI should better use the local expertise and professionals. The country advisor for OMNI has done an excellent job with limited resources.

c. Government

The First Lady is very interested in the subject and wants to show results at the next Summit of First Ladies. Micronutrients is a priority for the Health Ministry and the government.

The government is investing more resources for increasing the health care coverage in the population. There are the cultural and access barriers.

The prenatal coverage is 67% the first time and 20% for the third time. Only 20% of the deliveries are institutionalized. Thus there are concerns that this system may not be a good channel for supplements for the pregnant women.

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FIGURE 4. PEOPLE INTERVIEWED

Andreina Soria	OMNI
Paul Ehmer	USAID/Bolivia
Jorge Velasco	USAID/Bolivia
Juan Carlos Araya	MOH
Elva Fernandez	MOH
Oscar Zuleta	MOH
Jorge Rivero	MOH
María del Carmen Daroca	PAHO
Cinthya Costas	Grey-Bolivia
Giovanna Dávila	Grey-Bolivia
J. Manuel Ponce	Asociación de Molinos de Trigo
Mario Tellería	UNICEF
Ana María Aguilar	BASICS

THE PHILIPPINES

OCTOBER 28-31, 1996

RAPPORTEUR: DR. WERNER SCHULTINK

A. USAID SUPPORT TO MICRONUTRIENT PROGRAMS

The United States Agency for International Development (USAID) aims to contribute to the reduction of micronutrient deficiencies through the Opportunities for Micronutrient Interventions (OMNI) project. The OMNI project will benefit several countries in South America, Asia, and Africa and is unique in several ways:

- No other bilateral donor agencies have invested in such a significant way in the worldwide alleviation of micronutrient deficiencies.
- It aims to bridge the gap between research and large-scale intervention programs.
- It does not focus on single micronutrient deficiencies alone, but aims to combine strategies for different micronutrients (e.g., iron and vitamin A).

Considering the large negative impact of micronutrient deficiencies on human health and development, USAID should be commended for the OMNI project initiative.

B. MICRONUTRIENT SITUATION IN THE PHILIPPINES

USAID is involved with micronutrient programs in the Philippines through Helen Keller International (HKI) (Country Director R. Klemm) and through a local OMNI office (Resident Coordinator M. Capistrano). HKI has been active in Philippines since 1986 and has carried out the VITEX project since 1991. OMNI has maintained a local Philippine office since October 1995.

1. Prevalence of Deficiencies

Specifically in the past three years the Government of the Philippines (GOP) has been very active in alleviating micronutrient deficiencies. As a result the prevalence of nightblindness decreased from 0.7% to 0.4% between 1987 and 1993. However, vitamin A, iron, and iodine deficiency remain to be national public health problems. According to the 1993 Food and Nutrition Survey about 36 percent of investigated school-aged children had serum retinol levels below 20 E6g/dl, despite low prevalence of clinical signs of xerophthalmia. Iron deficiency is the most prevalent micronutrient deficiency. Anemia affects 49% of infants aged six to 12 months, and 44% of pregnant women. Large parts of the population remain affected by iodine deficiency disorders. About seven percent of the total population older than seven years suffers from goiter.

2. National Organizations and Agencies

Several departments, agencies, and institutions are involved with micronutrient programs. The Nutrition Service of the Department of Health (DOH) (Director Mrs. A. Ramos) is in charge of execution of micronutrient interventions. The Nutrition Service is also the official counterpart organization of HKI and OMNI. Important supporting agencies are the Food and Nutrition Research Institute (Director Dr. R. Florentino) of the Department of Sciences and Technology and the National Nutrition Center of the Philippines (Director Dr. F. Solon).

In 1993 the Philippine Plan of Action for Nutrition (PPAN) was initiated by the National Nutrition Council. As part of the PPAN a National Micronutrient Operational Plan (NMOP) was proposed by the National Micronutrient Action Team (NMAT). The NMAT has not yet been officially endorsed by the National Nutrition Council. Furthermore, a food fortification board was created consisting of governmental and research institutions as well as private industry to draft guidelines on micronutrient fortification of processed foods.

3. Existing Programs and Ongoing Trials

a. Supplementation

Nationwide all children between one to four years of age receive vitamin A supplements containing 200,000 IU twice per year. Distribution occurs on National Immunization Day and National Micronutrient Day (ASAP which started in 1993). The successful distribution and high coverage rate have led to a decrease in the prevalence of xerophthalmia. Due to both the current low prevalence of xerophthalmia and the costs (US\$ 1.7 million/yr. for vitamin A capsules), the issue of whether it is possible to stop nationwide supplementation and focus on risk groups only is currently being discussed.

Since 1993 iodine capsules (lipiodol with 200 mg potassium iodate) have been distributed to pregnant women once a year, irrespective of area or stage of pregnancy. In 1994 the iodine program was expanded to all married women between 15-40. In 1995 all women between 15-40 were included (irrespective of marital status). In 1996 iodine supplements were distributed to the same target groups as in 1995, but only in provinces where a prevalence of total goiter rate of more than ten percent existed (based on DOH surveys conducted between 1987-1990). Before 1996 a nationwide iron supplementation for pregnant women did not exist, but tablets were distributed depending on the activity of individual health centers. During the National Micronutrient Day of 1996 it was instructed that all pregnant women should be supplemented on a weekly basis. Official policy has yet to be formalized for iron supplementation.

In 1996 the GOP procured all the supplements—which was not supported by donor agencies. In the past years the responsibility for procurement and distribution of supplements was with the Nutrition Service of the DOH. In the framework of decentralization, the responsibility will be handed over to the provinces' and towns' Local Government Units (LGU). This process of decentralization will take about three years. The coverage rate may decrease during the transition period.

b. Food Fortification

Efforts for food fortification involve staple foods as well as specific products from private industry. A national program exists for the iodization of salt. Trials have been done to fortify wheat flour and sugar with vitamin A, and rice with iron. The situation is most advanced for wheat flour and, if all goes well, it is expected that within a year wheat flour will be fortified with vitamin A on a nationwide basis.

The DOH, together with private industry, has developed a seal of approval (Sangkap Pinoy) indicating adequate fortification with vitamin A, iron, and iodine to stimulate private food industry to fortify their products. So far three products may use this seal (sardines, margarine, orange juice) and 15 other products requested permission. The development and usage of the Sangkap Pinoy seal requires that several good quality laboratories are available who are able to carry out analysis under standardized conditions. At the time of the evaluation the process of selecting laboratories and setting up standards was still under way.

c. Short Description of the Activities of HKI and OMNI

In 1991 HKI started with the VITEX project. This project was carried out in three provinces: Quezon, Northern Samar, and Zamboanga del Sur. The project aimed to improve the distribution of vitamin A capsules and to improve infant feeding practices using a total yearly budget of about US\$ 300,000/yr. At the start of VITEX no large-scale vitamin A capsule distribution existed, and a 1991 representative survey indicated that less than ten percent of preschoolers had

received vitamin A supplements. HKI initiated the distribution to children who were found to be underweight during the national weighing day (1990-1992). In 1993 vitamin A supplementation to all small children became national policy using the National Micronutrient Day and National Immunization Campaign (Polio) as distribution times. HKI supported the DOH in the management and evaluation of the capsule distribution. A representative survey indicated that the coverage among preschoolers was between 80-90% in the three provinces, and that the prevalence of xerophthalmia had decreased significantly since 1991. HKI further developed several communication strategies to improve infant feeding behavior. Nutrition messages were communicated via comics, radio, and printed material to be used by midwives during training sessions with mothers. An attempt was made to investigate the impact of this communication strategy through two cross-sectional surveys and using weight-for-age as an indicator for improvement in nutritional status. However, the statistical analysis which was used and the selection of weight-for-age as an indicator don't draw any conclusion on the impact. More work needs to be done on existing data sets to evaluate the impact of the educational program. Currently HKI assists the DOH in the development of models through which LGUs can manage nutrition interventions, including supplementation and infant feeding. These models are developed in the three VITEX provinces. Furthermore, HKI activities will be expanded to eight other provinces using a USAID Child Survival Grant.

The local OMNI office just started in October 1995. It has the mandate to provide technical assistance to the supplementation and food fortification program. So far their role has mainly been one of a catalyst. OMNI has reactivated institutions to finalize the Micronutrient Operational Plan, and they have provided support to get the Sangkap Pinoy seal launched. OMNI also organized interlaboratory testing for the food quality control. Besides the catalyzing above-mentioned processes, most of OMNI-Philippines technical expertise lies in the field of food fortification.

C. EVALUATION OF ACTIVITIES

The evaluation will concentrate on the activities of HKI since the work of OMNI started too recently to be evaluated.

1. **The Extent to Which Existing Technologies and Approaches were Adopted and the Effectiveness of the Current Approaches**

The vitamin A supplementation program has been successfully changed from a targeted program reaching a small amount of children in 1991, into an effective nationwide program with high coverage after 1993. The usage of the National Vaccination Campaign and National Micronutrient Day for distribution of supplements was an excellent choice. The Philippines was among the first

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countries to use vaccination campaigns as a vehicle for vitamin A capsule distribution.

The high coverage was proven by national as well as provincial population-based surveys (80-90% coverage in VITEX provinces). The decline in xerophthalmia rates during the past few years is probably due to the supplementation program (currently 0.4% nightblindness). Child mortality data which were shown to the evaluation team during the field visit to Quezon province indicated that the mortality had declined significantly since the start of the vitamin A supplementation program. Although it is not possible to state on the basis of these data that the decline in mortality was really due to the vitamin A supplementation program, it is a very positive development which coincides with the program. Furthermore, the decline in mortality convinced the local health staff of the necessity of vitamin A supplementation. The current set up of the supplementation program is sustainable because the whole program is organized through government channels and all supplements are procured by the government. It is impossible to precisely quantify the contribution of HKI to the successful vitamin A supplementation program since their work was incorporated into DOH activities. However, based on the available documentation, observations in the field, and discussions with staff of DOH it can be concluded that their work has been extremely useful and sometimes essential in the choice, development, and management of the distribution mechanisms—especially considering the limited HKI budget. It should also be reminded that in the late 1980's the general opinion in the Philippines was that vitamin A supplementation was not beneficial and might have toxic effects. During HKI's presence this general opinion changed completely.

The opinion of the Mission about micronutrient interventions was difficult to estimate since they could not make time available to discuss them with the evaluation team.

The impact of HKI's work on nutrition education is still hard to evaluate. As previously mentioned, the available documentation on the impact of the different education campaigns on nutritional status is unsuitable. Although a lot of educational material has been produced which seems to be well accepted and appreciated by the DOH in Manila as well as by provincial health authorities in Quezon Province, a final strategy to improve feeding behavior of mothers cannot yet be selected. HKI does, however, have a longitudinal data set which can be used to evaluate the education program—this data set should be analyzed.

2. Extent to Which the Portfolio Anticipated and Took Action on Technical Program Issues that Effect Micronutrient Delivery

The successful delivery system of vitamin A capsules will be organized differently in the coming years. In the framework of decentralization the LGU will take over the management of the micronutrient supplementation program from the central government. HKI has been anticipating this change and is now developing new models together with DOH which will enable LGUs to manage the supplementation program.

D. CONCLUSIONS AND RECOMMENDATIONS

It can be concluded that the effect of USAID support through HKI and OMNI FS on the micronutrient situation in the Philippines is very positive. HKI has contributed in an important way to the success of the vitamin A supplementation program in the Philippines. The activities of the OMNI FS office have stimulated and supported local institutions and agencies to formulate crucial policy tools for the alleviation of micronutrient deficiencies. With its contribution USAID has not only improved the nutritional status of the Philippine population but assisted in the development of human resources.

Considering the existing situation and future expectations, the following recommendations can be made:

- Since both OMNI and HKI receive funding from USAID, and both agencies work in the field of micronutrients, it would be sensible to clearly differentiate between the activities of each agency. So far the experience of HKI has predominantly been in the field of supplement distribution programs and nutrition education of target groups. OMNI's technical expertise has been more in the field of food fortification. It is recommended that both agencies stick to these fields of technical expertise and try not to expand.
- USAID, through HKI, should continue to support DOH/Philippines in the development of models for micronutrient supplementation under a decentralized system. These new models should be tested out, and the implementation process should be monitored and evaluated. These experiences will be extremely useful, not only for the Philippines, but also for other countries in the region where possibilities for decentralization are attempted (e.g., Indonesia). Currently the coverage rate of the supplementation program is 80-90%. It should be investigated why the remaining 10 to 20% of children did not receive any capsules, and an attempt should be made to adapt the program based on the results of this investigation. Furthermore, it is crucial that the vitamin A capsule program continue to be executed nationwide during the coming years and

not be focused on perceived risk groups. Supplementation remains necessary since immediate sustainable improvements in vitamin A status cannot be reached through dietary changes or food fortification.

- The main micronutrient deficiency in the Philippines continues to be iron deficiency. Although this deficiency does not lead to dramatic, easily recognizable impacts such as child mortality and blindness, it is associated with negative birth outcomes, decreased work productivity, and impaired school performance and motor development in children. DOH has recognized the importance of iron deficiency but so far has little experience with large scale iron supplementation programs. Therefore, USAID should support the GOP in efforts to reduce the high prevalence of iron deficiency. These efforts should also include supplementation of other target groups besides pregnant women, such as infants and adolescent girls. The newly-adopted weekly supplementation program for pregnant women should be closely monitored, specifically on such issues as coverage rate and compliance with iron tablet intake. Focusing on iron should also be seen as a logical extension of the vitamin A work since the metabolism of iron and vitamin A are linked. Collaboration in this field should be taken up with HKI/Indonesia, and with other institutions from Indonesia which have extensive experience with iron supplementation programs.
- HKI should investigate and document the impact of the weaning moments nutrition education program. Based on the conclusions of this investigation, models can be developed for more widespread usage in the Philippines and possibly in other countries.
- Good programs can only be developed if past and ongoing experiences are carefully monitored and evaluated in a scientifically sound manner. HKI could thoroughly investigate strong and weak points of the vitamin A supplementation program and the nutrition education program. It is recommended that more work is done on the analysis of available information. OMNI should concentrate on impact analysis of fortified foods, including a cost-benefit analysis.
- The Philippines has many good and worthwhile activities and trials in the field of food fortification. These experiences can probably also be of significant value for other countries in the region. It is recommended that USAID continues to support the GOP in its various activities in this field. Considering the past activities and existing expertise it would seem most suitable that this would be a task for OMNI/Philippines. Especially worth mentioning is the wheat fortification program. Wheat is widely consumed and the fortification with vitamin A is likely to have a major impact on the vitamin A status of the population. It should be considered whether a

double fortification with iron is possible. The impact of the fortified food stuffs on the micronutrient status of the population should be monitored.

ADDENDUM

Summary of discussions with the Assistant Secretary of Health, Dr. AS Lopez, during a debriefing session at the Ministry of Health on Thursday October 31, 1996.

The GOP should be commended for its efforts in the alleviation of micronutrient deficiencies.

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EL SALVADOR

NOVEBER 3-10, 1996

*RAPORTEURS: ELIOT PUTNAM
GUILLERMO ARROYAVE*

A. INTRODUCTION

A 1988, USAID-funded survey revealing the highest levels of vitamin A deficiency and anemia in the LAC region, and a 1990 survey which demonstrated equally critical levels of endemic goiter among its school children, galvanized the government of El Salvador to vigorous efforts to control micronutrient malnutrition. For example, a vitamin A sugar fortification program, begun in 1993 with UNICEF, PAHO/INCAP, World Bank, and Japanese government support, will impact close to 90 % of the country's sugar production by 1997. Salt iodization begun in 1994 now covers 92 % (UNICEF and MOH estimates) of the country's salt production. And since January 1996, all flour produced in El Salvador's two mills has been fortified with iron.

The Ministry of Health's 1995-1999 National Food and Nutrition Plan of Action (NFNP) emphasizes reduction of micronutrient malnutrition as well as the importance of multi-sectoral collaboration, with strong participation by NGOs. Priority lines of action include continued strengthening of food fortification, health and nutrition education, community health promotion and healthy schools.

Since 1994, USAID's support to micronutrient initiatives in El Salvador has been channeled through the OMNI FS program. This began with a situation analysis which identified those aspects of the NFNP most in need of technical and financial assistance, taking into account disruptions caused by the process of decentralization of all health services begun by the GOES in 1995. A decision was reached to focus OMNI's efforts on

- strengthening the quality assurance system for fortified foods
- strengthening supplementation services

- assisting in the expansion of community health and nutrition education
- promoting NGO participation in micronutrient service delivery.

B. QUALITY ASSURANCE

Vitamin A fortification of sugar and iodization of salt already existed at the time of OMNI's inception. Hence, the project sought to assist the MOH in improving systems for ensuring quality control in these areas. With sugar fortification, OMNI provided technical assistance through INCAP to train management and laboratory personnel in the MOH and in sugar mills. With salt, OMNI sponsored a workshop to train salt producers in techniques to enhance salt quality and improve the iodization process.

Sugar fortification QA efforts have been well designed and effective, and OMNI should continue to provide training and technical inputs as needed. A substantial contribution to enhanced sugar quality would be the standardization in all sugar mills of the method by which vitamin A premix is added to the sugar—this system was developed at the University of Campinas in Brazil. There is also a critical need for back-up equipment for preparing the premix itself. The only mixer, located at the Jiboa sugar mill in San Vicente, operates around the clock during the sugar production season. Malfunction or need for repair, without back-up equipment available, would result in immediate suspension of sugar fortification nationwide. Finally, providing the Department of Nutrition with a computer system would greatly assist its ability to collect quality assurance data from around the country. Data is presently gathered and transposed by hand.

The quality of the salt produced in El Salvador at present is within official government norms. In the opinion of the site visit team, this calls into question any further OMNI efforts towards technological "improvements." Traditionally an independent lot, salt producers nonetheless willingly abide by the law requiring iodization of salt. But they have found manual methods of adding iodine, and of spot checking iodization levels, to be preferable to more sophisticated methods. It bears noting that modern iodization machines provided by the World Bank sit largely unused by salt producers. In short, salt iodization presently needs no further external inputs, except in the area of monitoring iodine intake by the population, which is supported technically and financially by UNICEF.

Iron fortification of flour is being carried out at an acceptable level of technological quality. There is, however, a lack of specific data on consumption of wheat flour in El Salvador by socio-economic strata and age group. This gap should be filled, so as to determine the extent to which iron in this food vehicle is reaching the most at-risk population groups.

The site team also calls attention to the September 1996 report of its consultant, Dr. Omar Dary, which looked exhaustively into all aspects of the Salvadorean fortification program as an excellent OMNI investment. The team urges consideration of all of the report's recommendations, many of which are reflected above.

C. SUPPLEMENTATION

At the request of the MOH Department of Nutrition, OMNI provided technical assistance in reviewing national protocols and guidelines for distribution of micronutrient supplements, primarily vitamin A and iron. Final drafts were completed in August of 1996 and are awaiting MOH approval.

Coverage of supplementation programs in El Salvador is known to be poor. In the public sector distribution has been hampered by problems inherent in adjusting to the new, decentralized health system. In the private sector, while many NGOs provide vital services in certain areas of the country, NGO activities are uncoordinated, and their quality and efficiency uncertain. (See below for further discussion of the NGO role in micronutrient programs.)

In addition to providing any additional TA requested by the MOH in implementing the new supplementation guidelines once they are approved, OMNI would render an important service by providing the training and other support needed to more completely and accurately assess coverage in different parts of the country. Accurate coverage information would be invaluable to the design of appropriate education and service strategies in both public and private sectors.

D. COMMUNITY HEALTH AND NUTRITION EDUCATION

In the early 1990s the MOH, with technical assistance from the Manoff Group (subsequently an OMNI subcontractor) and financial support from the World Bank, developed a National Program of Nutrition Education (NPNE). Components of the plan relevant to expanded understanding and consumption of micronutrients included promotion of use of vitamin A rich foods, including fortified sugar; promotion of use of iodized salt; and micronutrient education. For each component, educational materials were to be designed for families, community health workers and school children.

While UNICEF and the World Bank have provided financing for other components of the NPNE, OMNI was specifically requested to assist the Department of Nutrition in designing materials for increasing consumption of vitamin A rich foods, including fortified sugar. They undertook qualitative research with mothers and children, and drafted a comprehensive strategy, including messages and materials. The Department of Nutrition welcomed this

assistance and has requested further support in finalizing materials and training health workers, both public and private sector, in their use.

E. ROLE OF NGOS IN MICRONUTRIENT PROMOTION

At its inception, USAID requested OMNI to place a priority on learning about the role of NGOs in delivery of health services in El Salvador. Where appropriate, the goal was to enhance the NGO role in micronutrient activities, especially education for and delivery of micronutrient supplements in areas where government program coverage was weak.

With OMNI's financial support, ASAPROSAR, an NGO with headquarters in Santa Ana, surveyed some 300 health-related NGOs, and developed a profile of those with interest or involvement in nutrition. Thirty to forty NGOs with potential for more effective micronutrient activity were invited to a June 1996 OMNI workshop aimed at coordinating NGO and MOH activities. They expressed keen interest in receiving training and materials to enhance their ability to promote and provide micronutrient supplementation in the populations they serve.

Some confusion and misunderstanding have attended the process of involving NGOs in micronutrients. The MOH was unhappy with OMNI for initiating activities in the private sector without first coordinating with the Department of Nutrition. Subsequently, as it realized the potential for NGOs to supplement its own efforts, the MOH developed a set of prerequisites which, if met, would enable an NGO to enter into formal cooperation with the MOH in micronutrient activities. At the time of the site team's visit, eighteen NGOs had been accepted for such agreements by the Ministry, with more to be added as and when they meet the requirements.

Much work is needed to transform what is now a loose alliance between like-minded NGOs and the MOH into an effective partnership for national service delivery. All are looking to OMNI, in follow-up to its June meeting, to spearhead the necessary planning, training and coordination. The opportunity for developing a model of public-private partnership, one which might be used by other countries if proven effective, must not be missed.

F. COORDINATION AND FOLLOW-UP

OMNI inputs to date in El Salvador have, in general, been warmly appreciated, especially by the MOH Department of Nutrition. They have, however, lacked continuity and this has led to confusion and uncertainty on the part of Salvadorean partners. Lack of timely completion of the final design of educational materials and strategies for their use has delayed implementation of an important component of the NPNE. Lack of energetic follow-up to the June meeting of

NGOs has put full realization of the NGO micronutrient role and the NGO/MOH partnership in limbo. A more regular, even permanent (at least in the short term) OMNI presence in El Salvador would greatly enhance the continuity and impact of its initiatives.

OMNI's work should be undertaken with full knowledge and agreement of the government. If there was one overriding impression which the site team gathered, it was of the sincere commitment of the Ministry of Health to its micronutrient mandate, and to using all resources at its disposal to expand awareness and acceptance of the role of micronutrients in improved health. OMNI has made a good beginning in its role as partner in this enterprise. With careful planning and greater consistency, it can become a more effective participant.

Annex B. List of Persons Contacted

Persons Contacted

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OMNI

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Annex D. Scope of Work

**PROGRAM AND MANAGEMENT REVIEW
USAID'S MICRONUTRIENT PROGRAM² MANAGED BY G/PHN/HN**

SCOPE OF WORK

I. PURPOSE

The purpose of the Portfolio evaluation is to review the performance of the array of Cooperative Agreements (CA) and contract mechanisms in the Child Survival Division that are providing micronutrient services; recommend any future changes that may be necessary for the Portfolio to achieve its objectives in a timely manner; and to provide sufficient information to guide the development of future mechanisms.

The mechanisms to be reviewed include:

- Vitamin A for Health: Authorization Number 936-5116
- Opportunities for Micronutrient Interventions (OMNI): Authorization Number 936-5122
- Food Nutrition Monitoring and Support: Authorization Number 936-5110 (See Table 1)

II. BACKGROUND

USAID's micronutrient program began in 1965 with vitamin and mineral fortification of donated foods. In the 1970s, USAID's activities were devoted primarily to establishing the scientific basis for micronutrient interventions with a significant portion of funding going to U.S. universities for research. These early research activities focused on the important role that vitamin A plays in preventing specific disorders such as nutritional blindness (xerophthalmia).

The Agency is recognized for its pioneering role in supporting research in vitamin A which in addition to addressing xerophthalmia has elucidated the role of vitamin A deficiency in malnutrition and child survival. The very important work funded by USAID and implemented by Dr. Alfred Sommer of Johns Hopkins University and his colleagues from the Indonesian Health Ministry, demonstrated that mild vitamin A deficiency is associated with an increased risk of child death. The USAID-sponsored Indonesian clinical trial reported that village children who received high dose vitamin A supplements were 34 percent less likely to die than unsupplemented children.

The team will examine a portion of the micronutrient program, which comprises three project authorizations and is managed by G/PHN/HN.

In follow up to this ground-breaking research, between 1982 and 1992, USAID funded ten additional studies in Brazil, Ghana, India, Indonesia, Nepal, and Sudan to further validate the impact of vitamin A on mortality and morbidity. These studies conclude that vitamin A supplementation can reduce infant mortality as much as 40 percent, and decrease the severity of illness episodes. Because of this early work, USAID is recognized as having played the major role among all agencies working in nutrition, in identifying the critical characteristics of vitamin A deficiency. In addition to vitamin A work, USAID has also played a major role in clarifying the impact of other micronutrients on maternal and child health. We now know that at least three nutrients—vitamin A, iron, and iodine—have a profound effect on child survival, women's health, educational attainment, adult productivity, and overall resistance to illness.

A central theme of USAID's work in nutrition is the premise that nutrition problems, in general, and micronutrients, specifically, have a multi-sectoral etiology and thus require a multi-sectoral approach. As a part of this approach USAID has emphasized a combination of public and private sector intervention approaches—supplementation, food fortification, nutrition education, and dietary diversification—and has paid attention to what combination of interventions produce sustainable improvements in micronutrient status.

Recognizing the potential impact that addressing vitamin A deficiency could have on child survival, Congress established an earmark for vitamin A in 1985, which in 1991 was raised to \$10 million, and in 1993 more than doubled to \$25 million. This Agency target has remained fairly stable since 1993 at \$20 to \$25 million. Only a portion of these funds are under direct management control of the G/PHN/HN Office.

Configuration of the Micronutrient Portfolio

USAID's current portfolio of projects/mechanisms that address micronutrient malnutrition reflect the maturity of the micronutrient program at USAID and are listed in Table 1. Mechanisms of USAID Micronutrient Program Managed by G/PHN/HN.

While maintaining a commitment to continued expansion of the scientific basis for country activities through research, the Agency has steadily increased field implementation activities. USAID initiated many of the early field projects through national and international private voluntary organizations (PVO). A partnership with Helen Keller International (HKI) was established in 1988 with the development of the Vitamin A Technical Assistance Program (VITAP), which focused on providing technical assistance to PVOs in their efforts to reduce vitamin A deficiency. The Vitamin A for Health Project (VITAL), begun in 1989, was designed to provide field support to USAID Missions and regional bureaus to expand vitamin A programs worldwide. Most recently, in 1993, the

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Agency initiated a follow-on project to VITAL, the Opportunities for Micronutrient Interventions Project (OMNI). OMNI represents the largest single global effort to address micronutrients to date. The project was designed to deliver field support and to provide the necessary operations research to tailor interventions to country specific needs. The field implementation component consists of : 1) a contract with John Snow Inc. (JSI); and 2) a grant with UNICEF for salt iodization activities in Eritrea. The operations research component consists of a cooperative agreement with the International Life Sciences Institute (ILSI) (Table 1).

USAID's micronutrient-focused programs are a mix of efforts to generate new knowledge and technologies, and to strengthen the capacities of developing country institutions and people to address nutritional needs. These efforts include applied and operations research, technical assistance, training, and dissemination of state-of-the-art information on technical and program approaches to micronutrient malnutrition. The G/PHN/HN micronutrient portfolio currently supports work in over 25 countries, (Table 2).

III. CONTEXT FOR THE REVIEW

This review is taking place in a changed USAID environment. Pursuant to Vice President Gore's "Reinventing Government" initiative, USAID is using its more than 30 years of development experience to guide a massive re-engineering effort. This effort is guided by four core complementary values/principles: 1) a customer focus; 2) participation and teamwork; 3) empowerment and accountability; and 4) management for results. This evaluation will be guided by these principles.

As part of the strategic planning process, G/PHN/HN has developed strategic objectives for Child Survival (SO 3), and Maternal Health and Nutrition (SO 2) (see Annex A). These strategic objectives have brought greater clarity to the issues that the Office of Health and Nutrition will focus attention on.

The results from this review will provide critical information for the SO Teams in program design and for the micronutrient program Cognizant Technical Officer (CTO) in decisions about how to structure the micronutrient portfolio to make best use of scarce resources in achieving Agency objectives.

A. *Time Frame and Team Composition*

The Micronutrient Review will take place within a four month time frame—October 1996 through January 1997. A Team Planning Meeting (TPM) to orient and guide the team will be held the week of October 14. Field visits will occur in October/November. A preliminary Draft Report will be due mid-December. Finalization of the report and debriefing will be completed by the end of January 1997.

The Contractor will provide the services of a six to seven person evaluation team consisting of a: senior public health specialist who will be the team leader and health program management specialist; senior nutrition research specialist; communication/behavior change specialist; two to

three nutrition specialists to review the supplementation and food fortification field programs; and a private sector specialist to apply the private sector lens to the food fortification efforts.

The Team Leader maintains the overall responsibility for preparation and submission of the Final Micronutrient Review report to the Division for Child Survival (AID/G/PHN/OHN/CS). Specifically the Team Leader will be responsible for: (i) the technical quality of the evaluation; (ii) assuring that the relevant expertise of the Team is incorporated into the report; (iii) assigning specific tasks and responsibilities for each team member within the overall scope of work for the Review; and (iv) coordination and representation of evaluation activities with relevant USAID CA and contractor staff.

In addition to the above team members, the Contractor will provide an experienced facilitator to design and implement a Team Planning Meeting (TPM) and a series of debriefings. (see Section VI. for specific level of effort for team members)

The Team will be allocated a total of 11.45 person months (approximate) to complete the assignment. This includes the preliminary Team Planning Meeting (TPM), document review, domestic and international field trips, draft report writing and presentation, and final report writing and debriefings. The LOE and qualifications for each team member is outlined in Section VI.

Table 1.

MECHANISMS OF USAID MICRONUTRIENT PROGRAM MANAGED BY G/PHN/HN							
Institutional Contractor/ Cooperating Agency	Dates	Type of Agreement	Number	Funding Ceilings	Obligations through 6/30/96	Chief of Party	Focus
Authorization: Opportunities For Micronutrient Interventions (Omni) Authorization Number: 936-5122 Authorization Dates: 12/1/92 through 9/30/03 Authorized Life Of Project Funding (LOP): \$40,733,813 Buy-ins: <u>10,051,800</u> \$50,785,613							
John Snow, Inc.	9/16/93 - 9/15/98	Contract	936-5122	TOTAL:\$24,817,718	CORE: \$14,596,293 Q: \$5,302,340	Ian Danton-Hill	Management
Subcontractors to JSI: Of major importance = Bold							
Manoff	4/1/94 9/15/98	Subcontract	936-5122	\$1,351,703	\$624,921	Marcia Griffiths	Social Marketing
Johns Hopkins Univ. (JHU)	4/1/94 9/15/98	Subcontract	936-5122	\$1,752,785	\$292,145	Keith West	Research
Helen Keller Int'l. (HKI)	4/1/94 9/15/98	Subcontract	936-5122	\$1,246,590	\$319,253	John Palmer	Technical assistance, Nepal, Indonesia
Emory University (PAMM)	4/1/94 9/15/98	Subcontract	936-5122	\$3,504,870	\$739,713	Glen Maberly	Training
PATH	4/1/94 9/15/98	Subcontract	936-5122	\$569,263	\$165,890	Margaret Britton	Technologies

MECHANISMS OF USAID MICRONUTRIENT PROGRAM MANAGED BY G/PHN/HN

Univ. of Arkansas	4/1/94 9/15/98	Subcontract	936-5122	\$1,544,251	\$308,091	Phil Crandall	Food Technology
Univ. of CA. at Davis	4/1/94 9/15/98	Subcontract	936-5122	\$353,868	\$55,699	Kenneth Brown	Research
ILSI Research Foundation	6/1/94 9/15/98	Subcontract	936-5122	\$2,110,812	\$578,083	Susie Harris	Information Dissemination
International Life Sciences Institute (ILSI)	9/30/93 9/29/98	Cooperative Agreement	5122.02	\$7,815,569	\$5,088,112	Susie Harris	Operations Research
ILSI Sub: International Center for Research on Women (ICRW)	9/30/93 9/29/98	Subcontract	5122.02	\$1,124,232	\$564,390	Charlotte Johnson-Welch	Women-focused Operations Research
UNICEF (Eritrea)	12/15/95 12/15/97	Grant	5122.03	\$700,000			Salt Iodization

MECHANISMS OF USAID MICRONUTRIENT PROGRAM MANAGED BY G/PHN/HN

Authorization: Food Nutrition Monitoring And Support

Authorization Number: 936-5110

Authorization Dates: 7/5/89 Through 6/30/98

Authorized Life Of Project Funding (Lop): \$14,500,000

Buy-ins: 3,300,000

\$17,800,000

Emory University (PAMM) (Completed) Important for transition	9/29/92 9/29/95	Cooperative Agreement	5110.04	\$1,205,732	\$1,158,021	Glen Maberly	Training, ID, Policy
Peace Corps	9/30/92 9/30/97	PASA	5110.05	\$925,000	\$925,000	Angela Churchill	Technical Assistance and Training
IFPRI	6/10/93 12/31/96	CA	5110.07	\$918,035	\$918,035	L. Haddad	Field Research
IMPACT (ISTI)	9/30/90 9/30/96 No cost ext. to 9/30/97	Contract	5110.01	\$5,056,519	Core: \$4,479,422 Q: \$3,306,346	Bruce Cogill	Technical Assistance

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MECHANISMS OF USAID MICRONUTRIENT PROGRAM MANAGED BY G/PHN/HN

Authorization: Vitamin A For Health
Authorization Number: 936-5116
Authorization Dates: 8/19/88 - 9/30/97
Authorized Life Of Project Funding (Lop): \$34,000,000
Buy-ins: 2,860,000
\$36,860,000

Johns Hopkins University (JHU) ICEPO	8/30/85 9/30/96 No cost ext. to 9/30/97	Cooperative Agreement	5116.01	\$17,115,764	\$16,357,532	Keith West	Basic Research
JHU IIP	9/30/88 9/30/96 No cost ext. to 9/30/97	Cooperative Agreement	5116.02	\$3,564,942	\$3,564,942	Laura Caulfield	Basic Research
Helen Keller Int'l. (HKI) Indonesia	8/30/90 9/29/92 (Amended extend to 3/31/94)	Cooperative Agreement	5116.04	\$952,497	\$952,497	John Palmer	Technical Assistance
Helen Keller Int'l. (HKI) Philippines	9/30/90 9/30/96 Ext. to 9/30/97	Cooperative Agreement	5116.05	\$1,863,000	\$1,800,000	John Palmer	Technical Assistance

MECHANISMS OF USAID MICRONUTRIENT PROGRAM MANAGED BY G/PHN/HN

Helen Keller Int'l. (HKI) Bangladesh	9/11/92 9/30/96 Ext. to 9/30/97	Cooperative Agreement	5116.06	\$2,224,417	\$2,224,417	John Palmer	Technical Assistance
International Eye Foundation (IEF) (completed)	8/31/90 9/30/97	Cooperative Agreement	5116.07	\$300,000	\$300,000	V. Sheffield	Technical Assistance, Guatemala
International Eye Foundation (IEF) (ongoing)	8/31/95 2/28/97	Cooperative Agreement	5116.09	\$200,000	\$200,000	V. Sheffield	Technical Assistance, Guatemala
Florida State Univ. (completed)	9/24/90 9/30/95	Cooperative Agreement	5116.08	\$255,229	\$225,229		

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Table 2.
LIST OF COUNTRIES WITH MICRONUTRIENT ACTIVITIES

Bangladesh*
Bolivia*
Ecuador**
El Salvador*
Eritrea
Ethiopia (Omni/Research)
Guatemala
Honduras**
India
Indonesia**
Kenya
Malawi
Mexico
Morocco
Nepal**
Nicaragua
Niger
Papua New Guinea (Johns Hopkins Univ.)
Peru (Johns Hopkins Univ.)
Philippines*
Sri Lanka
Taiwan
Tanzania (Johns Hopkins Univ.)
Thailand
Zambia** (examine planning documents)
Zimbabwe

* = countries to be visited

** = countries to undergo desk review

Nutrition Communication Project (Nutricom) documentation will be examined for Mali

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IV. SCOPE OF WORK QUESTIONS

The Team will review existing CA and project documents, internal USAID documents, and consultant reports; conduct a series of program review meetings and focused interviews with CA and contractor staff; and carry out selected field assessments. **The objective of these activities will be to:**

- Describe the results (expected and unexpected), achievements, and consequences (i.e., implications) in addressing vitamin A deficiency (VAD) under the current set of cooperative agreements/grants and contracts in relation to their stated goals, objectives and deliverables as well as USAID strategies.
- Assess whether the Agency's micronutrient portfolio, as currently configured, is balanced and whether current strategies and mechanisms are results-oriented and sufficiently flexible and responsive to changes in USAID strategies and guidance as they have evolved over the life of the agreements/contracts. Is a different configuration of mechanisms warranted?
- Identify what aspects of the portfolio's work are most and least productive and what aspects are most valuable to various constituent groups (e.g., G/PHN/HN, missions, national governments, and international organizations).
- Provide recommendations for future research, policy, and program implementation priorities that would enhance the Agency's capacity to achieve critical results and measure them effectively.
- Comment on the leadership role the Agency has played among international organizations through use of micronutrient resources.

The Evaluation Team will need to address the following specific questions. These questions are grouped under headings (research, policy, communication, and service delivery) and parallel the Office of Health and Nutrition's Strategic Objectives and intermediate results that the Office is aiming to achieve. We ask the Team to give priority attention to those questions in bold. These are of greatest concern/interest to the Office of Health and Nutrition. Information from the related, non-bold-faced questions, will also be needed in reaching conclusions and recommendations, and providing context in which the reader can better understand the conclusions reached.

SECTION 1. RESEARCH AND ANALYSIS TO DEVELOP MICRONUTRIENT TECHNOLOGIES AND NEW APPROACHES

Section Leader: Dr. David Ross
Team Position: Senior Nutrition Research Specialist

The micronutrient portfolio has traditionally had a very large research component. Research has been carried out to provide a scientific basis for program approaches, to provide fundamental data on the impact of vitamin A deficiency on child survival and to address operational questions (see Annex B for a list of micronutrient OR). We ask the team to consider the role of research in the micronutrient portfolio broadly. Is the research component, as currently structured, helping to achieve the Agency's health and nutrition strategic objectives? More specifically,

1. To what extent has the micronutrient portfolio developed and implemented a coherent and well-targeted research agenda?

- ***purpose:*** Is there a strategic focus and clarity of purpose to the research agenda? What is the global and program relevance of the research undertaken? What research outputs contribute to the worldwide state of the art in micronutrients? Have there been any methodological breakthroughs, significant technical contributions, or new program approaches on micronutrient issues?
- ***balance and vision:*** How balanced is the research agenda? Is sufficient attention directed to addressing program constraints as well as basic research? Does the research provide a balance of cutting-edge operations research (OR)? How effective has the portfolio been in responding to new conditions, forecasting trends, and planning for emerging trends. Is there a clear vision of the investment priorities for the next generation of micronutrient research? Is the portfolio living off of yesterdays work?
- ***linkages:*** How well integrated is the OR with program activities? How well integrated is the research into national or regional policy, strategy, or operational activities within USAID-focused countries?
- ***management:*** How have research topics been selected? Has there been broad-based peer review and were peer review mechanisms documented? What has been the extent of research collaboration or cofinancing with other donor organizations, and have results been used to influence the program agenda of other organizations?
- ***design:*** Are the research projects designed to give the kinds of answers that USAID wants? Are research projects designed with appropriate funding levels and time frames in place? Can results be adequately disseminated after completion of studies within the time frame of the contract/cooperative agreement? Have adequate resources and oversight

been made available to assure successful execution of the design and produce clean, credible results?

- ***analysis:*** Have the CAs consolidated and interpreted research findings from across studies to arrive at the larger or global lessons learned? **To what extent have the program and policy implications of the research results been identified?**

2. Have the research findings been effectively used?

- ***communication:*** Have results, technical advances, and new approaches been adequately synthesized and disseminated to organizations likely to use them? If so, do we know how organizations have used them? Are these uses considered appropriate?
- ***USAID's impact monitoring:*** Did USAID Office of Health and Nutrition put an approach in place with measurable indicators to document the use of research results in policy formulation and program improvement?

3. What are the most promising future directions for research?

- ***technical:*** What areas merit emphasis now and in the future and what micronutrient questions remain unanswered? How appropriate is USAID's research mandate? Which of these should become the focus for new research efforts?
- ***USAID management:*** How can we increase the productivity of the portfolio's research investments? What kinds of agreements, portfolio organization or configurations are likely to be most productive in a re-engineered environment with limited resources and management constraints?

SECTION 2. POLICY AND RESOURCE ALLOCATION STRATEGIES

Section Leader: Eliot Putnam, Team Leader/Management Specialist

Primary Backup: Dr. Sandra Huffman, Public Health Nutritionist and Policy Advisor

As vitamin A research findings were verified, the micronutrient portfolio focused more attention on policy advocacy actions to assure that international and national decision makers had a clear understanding of: 1) the impact of vitamin A on child survival; 2) the need to introduce an intervention mix that is within a country's resource and infrastructure capacity; and 3) the knowledge of necessary regulatory reform and legislative changes needed to initiate private sector food fortification activities. In addition, efforts to shift micronutrient actions to the commercial private sector have received increased attention in the past few years.

1. How has the portfolio attempted to influence international and national policies and how effective have these approaches been?

- ***data for policy decisions:*** To what extent has the portfolio increased the availability of micronutrient status, coverage, and cost data that are critical for policy analysis and program decision making? Are there sufficient policy tools to support micronutrient policy dialogue?
- ***building commitment:*** Has there been an increase in political commitment and resources for micronutrient issues at the local, national, and international levels? What approaches in mobilizing resources have been most effective and why? What portfolio mechanisms have been the most effective in this area? Why? What are considered key elements to success in this area?
- ***policy advocacy and program implementation:*** Have USAID Missions been informed of important new program and policy directions in the area of micronutrients? What approaches have been most effective in getting USAID Missions to develop policies and programs and in getting national governments to move policies to program actions?

2. Has the portfolio increased resource allocations for addressing micronutrient malnutrition?

- ***resources and private investments:*** Has policy dialogue been effective in increasing access to micronutrient goods or coverage? Has the ratio of public to private investments in micronutrients changed over the past five years? What policy approaches and mechanisms have been most cost effective in mobilizing or leveraging resources and why?
- ***coordination & collaboration:*** Is there sufficient intra-portfolio collaboration as well as collaboration with other agencies and institutions to assure efficient and effective use of resources, and to avoid duplication of effort or conflicting approaches? In what areas is better coordination needed? What has been the quality and effect of collaboration with other groups/donors/projects on policy issues?
- ***sustainability:*** Taking into consideration the capabilities and infrastructure of the countries worked in, which results are likely to be sustained over the next few years? What proportion of countries has a sustainable intervention mix in place as a result of policy inputs? Are individual programs or countries at a sufficient stage of maturity that transition planning or close-out is feasible? What approaches to enhancing sustainability and building institutional capacity have been most effective? What has been the most effective portfolio mechanism in dealing with sustainability issues? What elements have contributed to this success?

- ***scaling-up:*** How effective have the various CAs and contractors been in taking micronutrient, especially vitamin A, actions to scale? What were the constraints and how have they been addressed?

3. What are the most promising future directions in policy?

- ***lessons learned:*** Have the lessons learned from prior work been synthesized and used to refocus programs? **What are the priority policy issues that need to be addressed in the next five years?** Identify the most important types of linkages or carry-overs from current policy activities that need to be sustained and extended; to what extent have these linkages been made?

SECTION 3: BEHAVIOR CHANGE AND COMMUNICATION STRATEGIES

Section Leader: Nancy Torrey

Team Position: Behavior Change/Communication Specialist

The portfolio has invested significant resources in developing and testing approaches that: 1) influence consumer demand and/or the use of micronutrient products and services; 2) change food and dietary practices; or 3) promote preventive behaviors in target populations. The team is asked to review these efforts with an eye toward clarifying the larger lessons learned; identifying what approaches are effective, and what results USAID can realistically expect from social marketing and community-based behavior change approaches in the area of micronutrient malnutrition; as well as commenting on whether the portfolio is using state-of-the-art tools and technologies.

1. Do we have adequate knowledge about what works, why, and the costs associated with implementing behavior change approaches?

- ***research foundation:*** How successful has behavioral research been in aiding the development of social marketing and communication approaches? Has there been sufficient research investments in this area? If not, where are the gaps?
- ***demonstrating effectiveness:*** **To what extent have models or pilot programs been effective beyond local-level impact?** What have we learned about bringing behavior change pilot projects to scale or about institutionalizing these approaches in the public and private sectors, and disseminating findings to a broader audience? Are formative research, social marketing, and communication tools integrated into the operations of national organizations?
- ***costs:*** **Do we have sufficient analysis on the fiscal, management, opportunity, and sustainability costs of social marketing and community- and household-based**

approaches to changing behaviors, (i.e., dietary, supplement compliance, purchasing patterns)? Has any attempt been made to monitor the amount to which the national government or the private sector has absorbed the costs and responsibility for all/some relevant communication and behavior change activities, and what are the results? Are the methods and materials the portfolio has promoted affordable by national governments?

- **measuring impact:** To what extent has the portfolio developed, adapted and extended effective criteria for evaluating community-based and behavior change approaches?

2. How effective has the portfolio been in building understanding and demand for micronutrient interventions?

- **social marketing:** Have social marketing techniques been utilized as a means to both change behavior and to create demand for and use of micronutrient products? Has the portfolio utilized these techniques effectively and what are the untapped opportunities? To what extent has the lack of consumer information (at all levels) about the value of prevention and the availability of care or preventive approaches hampered the market for micronutrient services?

3. What are the most serious constraints and promising future directions in this area?

- **lessons learned:** What are the gaps in behavior change/communication? Based on the current state of the art, what areas hold the greatest promise for achieving results on USAID's investments within a reasonable time frame?
- **USAID management:** Are there more productive and cost-effective ways to organize and manage these activities?

SECTION 4. SERVICE DELIVERY

Section Leader: Dr. Sandra Huffman
Backups: Dr. Alberto Nilson, Dr. Guillermo Arroyave, Dr. Rainer Gross,
Dr. Werner Schultink
Team Positions: Public Health Nutrition Specialist/Policy Advisor
(respectively) Private Sector Specialist
Food Fortification Specialist
Vitamin A Supplementation Program Specialists

Portfolio resources dedicated to field support and implementation activities have increased over time, reflecting the need to apply research findings and experiences from field studies and pilot programs. The team is asked to review and comment on the approaches used to accelerate the adoption of micronutrient interventions via public and private sector service delivery systems.

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1. To what extent have existing technologies and approaches been adopted and how effective are the current approaches?

- ***increasing coverage:*** How effective has the portfolio been in accelerating USAID Mission adoption of vitamin A interventions? What were the constraints and how were they addressed? Have these interventions been main-streamed—and what are the best approaches? What are the successful models for incorporating micronutrient prevention into primary health care strategies? Are current models replicable and sustainable?
- ***organization & management:*** What are the most effective ways to organize and manage the delivery of vitamin A services and technologies? Has sufficient attention been paid to this issue? Is there an appropriate balance between emphasis on the technical content of nutrition/micronutrient (preventive and therapeutic) services, and the systems and processes through which these services are delivered? **What are the major constraints to increasing and sustaining coverage in the service delivery system, i.e.,** are the common delivery systems being overburdened by pressure to integrate; by weak supervision systems? What is the projection for the future; where are gains most likely to be made?
- ***impact:*** Has there been a decline in VAD associated with policy or program actions? To what extent have coverage rates changed as a result of actions initiated by the micronutrient program? What approaches have been particularly effective in increasing and maintaining vitamin A coverage rates?
- ***increasing access to micronutrient services:*** How has the portfolio approached the issues of increasing access to micronutrient services? How effective are these approaches and can the results be replicated at a scale that would have a public health impact? Based on portfolio experience, what alternative delivery systems look most promising? Has the capacity of both international and national PVOs to deliver services been increased? Are these efforts scalable?
- ***supplementation:*** Has the project developed replicable models for increasing vitamin A supplementation coverage? Have the results, lessons learned, cost, and management data from these models been adequately disseminated? Are adequate plans in place to address vitamin A supplement financing issues?

2. To what extent has the portfolio anticipated and taken action on key technical and program issues that affect micronutrient service delivery?

- *decentralization*: Has the effectiveness of local level planning models been demonstrated and disseminated?
- *integrated approaches*: Have micronutrient interventions been main streamed in the MCH service delivery system, and has there been adequate attention to leveraging resources by coordinating with other child survival and maternal health collaborating agencies on these issues?
- *ability to change*: How effective have the various portfolio mechanisms been in understanding and creatively adapting to important programming trends in: USAID Missions, (i.e., limited ability to take on new actions), the Global Bureau (strategic planning, field support), and the Agency (re-engineering)?

SECTION 5. MANAGEMENT

Section Leader: Eliot Putnam

We ask the Team to review and comment on a number of management issues regarding the micronutrient portfolio and the individual mechanisms within the portfolio. Attention should be directed towards: 1) assessing if the current mechanisms are the most cost-effective means for the Health and Nutrition (HN) Office to achieve its strategic objectives; 2) examining the management of resources by the field support mechanism (OMNI/FS); and 3) identifying USAID management constraints and opportunities to decrease the management burden on the Office of Health and Nutrition. The following questions should guide the Teams' efforts:

1. CA and contractor management of resources

- ***planning***: To what extent have the CAs and contractor's identified objectives, prioritized activities, and reported on how their actions have contributed to USAID's goals and objectives? Do annual work plans and annual progress reports accurately and fully reflect USAID's goals and objectives? What elements are missing or are not consistent? What is the system or criteria used (if any) to identify and select tasks for the projects to work on? Is there a clear and credible relationship between activities undertaken and the overall plans and objectives of USAID (country-specific and global)?
- ***client satisfaction***: Do the current set of agreements (individually and as a whole) meet the needs of the Missions, regional bureaus, and host country governments? How responsive has the portfolio been to various constituent groups? Have services been communicated and marketed effectively?

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- ***CA use of resources:*** To what extent have the various agreements operated with an eye towards making the best use of limited resources by collaborating, sharing costs, and leveraging resources—both among portfolio partner and external groups? Are the agreements staffed adequately in terms of numbers, technical capability, management, and operational capability?
- ***documenting and reporting results:*** What steps have been taken to collect and analyze program performance as well as to monitor on an ongoing basis the achievement of objectives? When information was collected, was it used effectively for planning or advocacy, or in developing the larger global lessons learned?

2. USAID's management of portfolio resources

- ***setting priorities:*** How were priority actions determined and were the plans and strategies sufficiently clear to give focus to priority actions? Were user needs clearly defined? **Was the balance of resources dedicated to research as opposed to application appropriate and effective?** Were operational priorities clear to all CAs and contractors?
- ***oversight:*** What has been the quality and quantity of USAID oversight of portfolio actions? How active and effective has the Cognizant Technical Officer (CTO) been in the administration and technical management of the project? Are the performance monitoring system and tools (quarterly reports, work plans, etc.) sufficient to measure and communicate performance and progress?
- ***leadership:*** Has the CTO been an effective leader in influencing the micronutrient policy agenda of international organizations, leveraging resources and promoting a common approach to program actions? nutrition/micronutrients

V. METHODOLOGY: THE EVALUATION PROCESS

The process for conducting this evaluation will emphasize basic re-engineering principles. Both the "clients"—the Missions, regional bureaus, national governments, international and national PVOs—and the service providers (CAs and contractors) will be active participants in deliberation and analysis of the "value" of the products and services. (Valuation deliberations and analysis). The Team will use a variety of interactive forums to collect and verify information—it will not focus entirely on "interviews," document review, and passive site visits.

Participation of Clients and Stakeholders

In addition to reviewing program documentation and individual interviews with clients and stakeholders, the Team, with the assistance of the Team Leader, will conduct a series of focused program review meetings with key CAs, contractors, and Global and regional Bureau staff. It is our assumption that a strong client focus and a continuous cycle of operational analysis by the organizations providing services should be conventional procedure. We expect that these meetings will have an analytic, not promotional focus. They are intended to provide the technical and program staff of the various projects and CAs with an opportunity to examine, diagnose, and contemplate their program operations against the evaluation questions posed by USAID. It will provide the Team with an opportunity to draw on the program and operations capacity of the various staff members, and to understand in greater depth the constraints, problem-solving approach, and operational skills of the service providers and their staff.

Field Assessments

The quality and appropriateness of the technologies, approaches, and services provided by the various mechanisms in the micronutrient portfolio to a large extent determines use, adaption, maintenance, and ultimately sustainability. It is our intention that this evaluation go beyond the conventional evaluation site visits to look at field operations in a few key countries to assess how well the "vision" matches the "reality." We intend that the Evaluation Team focus on a few key questions in each region and verify how well, and at what cost field operations are answering these questions.

The field visits will be made by mini-teams with travel to Asia and Latin/South America simultaneously. Specifically the Asia mini-team will: Assess the mature research and service delivery programs in Bangladesh and the Philippines and conduct a desk review of the programs in Nepal and Indonesia. For the most part critical insights into the dynamic of instituting a sustainable intervention mix will be found in these programs. Understanding the impact of research on initiation, promotion of micronutrient activities and the evolution of these programs will also be seen in countries like Indonesia. The HKI regional representative, stationed in Indonesia, will be available to meet with the Evaluation Team in the Philippines to provide a country (Indonesia) and regional perspective.

Extensive urbanization, geographic, and economic stratification of vitamin A problems within countries, the magnitude of the anemia problem, and the limited capacity that public sector delivery systems have to deal with these nutrition problems has led to greater program emphasis on food fortification and partnerships with the commercial private sector. Thus the feasibility of achieving coverage of targeted populations and maintaining adequate national regulatory control and monitoring of commercial activities are priority issues. Latin America is the site of the most mature food fortification efforts. The LAC mini-team will engage in discussions with key stakeholders inside and outside the health sector, i.e., LAC Bureau health and economic staff, commercial private sector groups, PVOs and CAs engaged in private sector initiatives to

understand the regional perspective and policy and program performance. Field assessments of food fortification and PVO actions in the El Salvador and Bolivia programs will be made.

Infrastructure, resource constraints, and competing priorities dominate the thinking about why African missions are reluctant to initiate micronutrient actions. A better understanding of the constraints to vitamin A programming needs to be diagnosed and discussed among key Agency staff. The Team will engage key CA technical staff, Africa Bureau, and Office of Health and Nutrition staff in an in-depth discussion of micronutrient programming successes and constraints. No field visits to Africa are envisioned.

VI. LEVEL OF EFFORT AND TEAM QUALIFICATIONS

<u>Labor Category</u>	<u>Work Days</u>
■ Senior public health specialist (Team Leader) policy/management specialist	50
■ senior nutrition research specialist	30
■ communication and social marketing specialist	43
■ nutrition specialist(s) food technologist(s)	40
public health nutritionist	43
■ private sector specialist	10
■ TPM facilitator	6
■ Evaluation Manager	30
Total Time (approximate)	11.45 person-months

The **senior public health/policy management specialist** should have at least fifteen years of international development experience in public health and in designing, implementing, and analyzing international health policy and management issues. Familiarity with USAID evaluation work and strategic planning in the current re-engineered environment is essential. USAID evaluation and project design experience is essential, as is excellent written and verbal communication skills. A demonstrated capacity to lead technical teams and to produce a concise, cohesive, and coordinated product is required. Familiarity with nutrition issues is desirable.

The **senior nutrition research specialist** should have an exemplary professional background in international nutrition; significant basic and applied research experience; and a demonstrated capacity to understand and assess the policy and program applications of nutrition research.

The **communication/behavior change specialist** should have a least ten years of experience designing, implementing, and managing public health behavior change programs in developing countries. Familiarity with nutrition issues is desirable.

The **nutrition specialist(s)** should have at least ten years experience in developing, implementing, and managing international nutrition and food fortification programs. Professional training and qualifications in nutrition, experience with operations research, and a demonstrated capacity in program and project evaluation are essential.

The **private sector specialist** should have worked in the private sector, specifically in food fortification, to lend the private sector perspective to USAID's food fortification efforts.

The **TPM Facilitator** should possess excellent training and facilitation skills. He or she should have had experience in facilitating a planning process that allows team members to: become acquainted with the scope, skills, and contributions of individual members; develop a shared understanding of the team scope, final product, purpose, and rationale for the assignment and its key stakeholders; develop an approach for completing work as a team; develop a work plan for completing the assignment as well as an outline for the final product; and establish team operating norms.

VII. DELIVERABLES

Final Report(s)

The Contractor will provide the CTO and Child Survival Division Director with eight copies of the draft evaluation report for review and debriefing no later than two weeks following the completion of field assessments and CA interviews (preliminary schedule outlined below). USAID will provide written comments to the Team on the draft report within two week of submission of the first draft of the report.

The Team will provide both the final report and a separately bound synopsis of the final report by January 31, 1997. The synopsis should contain an executive summary, findings and conclusions. The final report should contain an executive summary and the body of the report which should be organized into findings, conclusions and recommendations. The report should be no longer than approximately 50 pages, excluding Appendices.

In addition to eight copies of the final report, the Team will also provide an electronic copy.

Debriefings

At the completion of the field assessments and the CA meetings and interviews the Team will provide the CTO and Director of the Child Survival Division with an informal briefing and status report on the review process.

The team will present two USAID internal debriefings and one external CA debriefing. A management and program briefing will be provided to the Office of Health and Nutrition senior staff. A second, technical briefing will be provided to the Office of Health and Nutrition and Bureau staff. An external debriefing will also be scheduled with the various CAs and contractors that operate under the micronutrient portfolio to provide feedback and an opportunity to discuss findings from the evaluation

Preliminary Schedule

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|----------------------------------|--------------------|
| ■ TPM | October 14-16 |
| ■ Meeting with CAs, USAID | October 17-22 |
| ■ Individual Interviews with CAs | Oct. 23-25 |
| ■ Field Assessments | Oct. 28-Nov. 8 |
| ■ Informal debriefing G/OHN/CS | Nov. 15 |
| ■ First Draft to USAID | Dec. 16 |
| ■ Comments due from USAID | January 6, 1997 |
| ■ Debriefing to USAID and CAs | Week of January 20 |
| ■ Second Draft | January 20, 1997 |
| ■ Final Report(s) | Jan. 31, 1997 |

VIII. TECHNICAL DIRECTIONS

Technical supervision of this portfolio review will be provided by USAID/G/OHN/CS. Dr. Victor Barbiero, Chief of the Child Survival Division will provide program oversight of the evaluation. Dr. Frances Davidson, the CTO for the micronutrient CAs and contracts will provide technical guidance to the Team.