Micronutrient Global Leadership

Final Report

September 29, 1998 - September 28,2005

USAID
FROM THE AMERICAN PEOPLE

Cooperative Agreement
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MICRONUTRIENT GLOBAL LEADERSHIP

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HRN-A-00-98-00027-00

FINAL REPORT

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September 28, 2005

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The Steering Committee members for both IVACG and INACG provided valuable scientific insights and energy to MGL. In particular, Dr. Alfred Sommer, Chair of the IVACG Steering Committee, led IVACG through a significant growth period and expansion of scope. His leadership was an essential component of IVACG's continued success. Dr. Lena Davidsson as Chair of the INACG Steering Committee provided direction as the new group got off the ground. I am grateful to the individual members of these two steering committees for their unselfish dedication to improving micronutrient status of populations worldwide. Serving as volunteers, they each made significant contributions to MGL's work.

Dr. Penelope Nestel served as a consultant to the project for much of its life. Her keen understanding of the problems faced by those trying to implement vitamin A and iron programs in the field were essential in selecting Targeted Operational Research topics and investigators to carry out the work. She brought a level of scientific rigor to these research projects that ensured the output would be useful for others in the field.

The staff of the ILSI Research Foundation's Human Nutrition Institute provided the day-to-day effort that kept the project on track. Three program managers worked on this project. Ms. Laurie Lindsay worked with IVACG and INACG for many years before this cooperative agreement. Though she left ILSI early in this project to pursue other interests, she returned to help on site with the IVACG/INACG meetings. Her gracious and warm personality combined with her dedication to making sure everything was in place ensured that these meetings were well executed.

Ms. Dorothy Foote followed in Laurie's footsteps and quickly learned how to plan and implement the large international meetings. Her love of public health work and dedication to improving people's lives was an important contribution to her time with the project.

When Dottie moved on to Helen Keller International, the project was fortunate to find Ms. Veronica Triana, another dedicated public health leader. Veronica has moved the IVACG/INACG meetings to a new level with larger meetings (Morocco and Peru) and the inclusion of IZiNCG. She is a very capable manager and has taken on increasing responsibility for the whole project, including the drafting of this report.

Other ILSI staff were also indispensable to the success of the project. Ms. Melinda Thomas and Ms. Carolyn Bethea deserve special recognition for their dedication to making sure that the many small tasks necessary to keep the project moving forward were completed. Ms. Diane Dalisera, who provided logistical expertise in planning and

executing the international meetings and expert consultations, provided her considerable knowledge and skill to the project. Others also helped for short periods of time or in very specialized tasks, including Mr. Dwayne Milbrand, Ms. Kathy Krolak, Ms. Patricia Arnold, Ms. Anita Johnson, Ms. Brenda Kaechel, Ms. Sharon Galloway, and Ms. Jennifer Cassidy.

It has been my honor to work with these people and to witness first hand their expertise, skill, humanity and dedication in carrying out the work we were asked to do. Improving public health, while an important goal, is a constant challenge that at times seems insurmountable. Nonetheless, as we look back on the contributions made through the MGL project, I hope all will agree with me that we did make small, but significant steps, to improve the lives of children and women worldwide.

Suzanne S. Harris, Ph.D.
Project Director

Executive Summary

The U.S. Agency for International Development (USAID) and the International Life Sciences Institute (ILSI) Research Foundation implemented the Micronutrient Global Leadership (MGL) project from September 29, 1998–September 28, 2005 to support global technical leadership in the area of micronutrient deficiency prevention and control.

There were three components covered by the MGL project: 1) to serve as secretariat to the International Vitamin A Consultative Group (IVACG), 2) to serve as secretariat to the International Nutritional Anemia Consultative Group (INACG), and 3) to organize expert panel consultations and targeted operational research to provide a better understanding of the factors that contribute to successful replication and expansion of micronutrient deficiency intervention programs.

The MGL project supported 4 major international meetings, 4 IVACG /INACG scientific consultations, 18 research grants, 8 expert panel consultations, 26 primary publications, and 21 other publications.

During the MGL project, IVACG and INACG expanded their scope of interest to include multiple micronutrients. The traditional IVACG meeting grew to 800 participants, and to include symposia on iron and zinc deficiencies, in addition to vitamin A. The research grants provided a vital opportunity to fund major research questions related to micronutrient deficiency control, innovative ideas for micronutrient deficiency assessment and delivery of micronutrients, and best practices in implementing micronutrient programs. The expert panel consultations and publications were important vehicles to achieve consensus within the scientific community on a specific topic, to identify research gaps, and to disseminate this information to the broader community.

Improving maternal health as a way of improving child survival as well as benefiting the mother emerged as a major contribution from the MGL project; the topic was highlighted in sessions during the IVACG/INACG international meetings, examined in several research grants, and reviewed during several expert panel consultations. The MGL project also contributed to building the science base for effective fortified complementary foods.

The MGL project provided an important contribution to public health by guiding the micronutrient field forward and providing opportunities for research, global exchange of information, discussion forums, and expert consultations to resolve difficult questions. There are few alternative sources of funding for these types of critical activities. USAID's support for this project allowed the field to advance more rapidly toward the global goal of preventing micronutrient malnutrition.

I. Introduction

The U.S. Agency for International Development (USAID) and the International Life Sciences Institute (ILSI) Research Foundation implemented a 7-year cooperative agreement from September 29, 1998–September 28, 2005 that supported global technical leadership in the area of micronutrient deficiency prevention and control. The following is a report of the activities undertaken under this cooperative agreement including its successes and lessons learned.

II. Objectives of the Cooperative Agreement

The Micronutrient Global Leadership (MGL) project was designed as a five-year project to provide scientific support to the leadership efforts of USAID to eliminate vitamin A deficiency and significantly reduce iron deficiency anemia. There were three components covered by the MGL project: 1) to serve as secretariat to the International Vitamin A Consultative Group (IVACG), 2) to serve as secretariat to the International Nutritional Anemia Consultative Group (INACG), and 3) to organize expert panel consultations and targeted operational research to provide a better understanding of the factors that contribute to successful replication and expansion of micronutrient deficiency intervention programs. The MGL project was extended through a two-year no cost extension.

III. International Vitamin A Consultative Group (IVACG)

The International Vitamin A Consultative Group (IVACG) was founded in 1975 by USAID and has received its support for 30 years. A list of the IVACG Steering Committee members during the life of the MGL project is included in Appendix A. IVACG provides policy statements and state of the art reviews of scientific questions of critical importance to the implementation of vitamin A deficiency control programs. A list of IVACG publications is included as Appendix C. More information about IVACG and other MGL publications is included in section VII of this report. IVACG also

provides an exchange mechanism for scientific and programmatic information through its international meetings held every 18–24 months.

IVACG held four large international meetings under the MGL project in Durban, South Africa (1999), Hanoi, Vietnam (2001), Marrakech, Morocco (2003), and Lima, Peru (2004). The complete list of IVACG and INACG meetings held during the MGL is available in Appendix B. Interest and attendance at IVACG meetings has grown significantly since its inception in 1975. In the early years, IVACG meetings were small, with 30–40 invited participants focusing on scientific research. The meetings held under the MGL project continued to grow steadily, with 580 participants from 66 countries in Durban, 557 participants from 63 countries in Hanoi, 659 participants from 69 countries in Marrakech, and 801 participants from 71 countries in Lima—the largest IVACG meeting to date.

A. International Meetings: Opportunities for the Host Country/Region

IVACG holds its meetings in countries and regions that have a recognized problem of vitamin A deficiency. IVACG meetings have brought national and international recognition to achievements within the host country and region, which has led to support for efforts already underway to combat vitamin A deficiency. For example, the IVACG meetings in Hanoi, Marrakech, and Lima all coincided with the national efforts to fortify local staple foods with micronutrients, and the meetings helped raise awareness within the host country and region of the impact of micronutrient deficiencies on public health and local economies.

IVACG meetings also provide an opportunity for the host country to hold a national or regional symposium in conjunction with the IVACG meeting. The local organizing committees for the meetings in Durban, Hanoi, Marrakech, and Lima took advantage of the presence of international experts in their country to host a national micronutrient symposium in conjunction with the IVACG meeting.

Host countries have also organized post-meeting trips of professional interest for meeting participants in which local health and nutrition projects are highlighted. Study tours offered at IVACG meetings included a visit to a rural South African village to learn about an integrated community health project, a visit to a Vietnamese village where home gardening and animal husbandry techniques were being used to improve community nutrition, a demonstration on fortification of wheat flour with iron at a medium-sized mill in Marrakech, and a trip to the Peruvian highlands to visit a UNICEF growth monitoring and promotion project. These study tours provided unique opportunities for donors, program planners, scientists, and policy makers alike to learn about the host country's successes as well challenges in implementing micronutrient deficiency control projects.

B. Scientific Consultations: Authoritative Interpretation of Scientific Data

In addition to the large international meetings, IVACG has hosted smaller expert meetings on scientific questions requiring resolution for policies and programs to move forward. Two such meetings took place under the MGL project.

The first of these meeting took place in Annecy, France in October 2000. The purpose of the meeting was to comprehensively review recommendations for the assessment and control of vitamin A deficiency. At the time, the last comprehensive series of recommendations for the control of vitamin A deficiency had been issued more than two decades ago. Since then, IVACG and other organizations had periodically issued policy statements, guidelines, and recommendations on an ad hoc basis. In preparation for the meeting, a series of expert papers were commissioned by IVACG. The papers were rigorously deliberated and revised by the group of experts that met in Annecy. The recommendations were presented for final agreement at the XX IVACG Meeting in Hanoi, in February 2001. The result of the meetings was publication of the expert papers as a supplement to *The Journal of Nutrition* (132: 2843S–2990S, 2002), and a short IVACG Statement summarizing the recommendations, "The Annecy Accords to Asses and Control Vitamin A Deficiency: Summary of Recommendations and Clarifications."

The second such meeting that took place under the MGL project was held at the UNICEF Innocenti Research Center in Florence, Italy in April 2005, organized under the auspices of WHO/UNICEF/IVACG. This meeting enabled scientists active in micronutrient health research to focus on a limited set of emerging issues related to both the efficacy and safety of micronutrient supplementation that bear upon health and nutrition policies and that required relatively urgent clarification through new, strategically conducted research.

The overarching goal of the meeting was to bring clarity and focus to the research agenda of greatest programmatic priority. Three issues dominated the discussion: 1) The health consequences of deficiency/supplementation of individual micronutrients, principally vitamin A, zinc, and iron; 2) The health impact of simultaneous supplementation with varying combinations and dosages of multiple micronutrients (including but not limited to the three listed above); 3) The relevance of population characteristics (co-morbidities with HIV and malaria, baseline micronutrient status, anthropometric indices, and other nutritional/health/ethnic/cultural factors) on the questions raised in numbers 1 and 2 above.

It is anticipated that future meetings will explore other timely issues relevant to the emerging agenda of nutrient-nutrient and nutrient-disease interactions as they relate to improving the health of disadvantaged populations.

C. Future of IVACG

During the MGL project, IVACG recognized the growing interest in research and interventions that included multiple micronutrients. IVACG began to address this issue by inviting INACG to append a one-day symposium to the IVACG meeting in Durban, and continued that tradition at the meetings in Hanoi, Marrakech, and Lima. For the latter two meetings, IVACG also invited IZiNCG (the newly formed zinc consultative group) to join with a one-day symposium of its own. Meeting participants reacted positively to the merging of these meetings. A new approach was used to plan the

IVACG meeting in Lima: one to two experts from the iron, zinc, and maternal health communities were invited to sit on a program planning committee for the Lima meeting. The planning committee developed a program that included a scientific session on multiple micronutrients and one on maternal health. In preparation for the meeting in Lima, IVACG also updated its 1996 statement, "Strategic Placement of IVACG in the Evolving Micronutrient Field" to convey how IVACG was evolving to address the interest in multiple micronutrients, in the context of the changing global health situation. IVACG plans to continue to seek new ways to address the evolving micronutrient field and to provide broad technical guidance on questions concerning nutrient-nutrient interactions and nutrient-disease interactions and identifying areas in need of further research.

IV. International Nutritional Anemia Consultative Group (INACG)

The International Nutritional Anemia Consultative Group (INACG) was established in 1978 by USAID to raise awareness to the severity and public health burden of iron deficiency anemia. Today, INACG is involved in generating broad support for action by developing countries to control iron deficiency anemia. Operating in a manner similar to IVACG, INACG sponsors international meetings and scientific reviews and convenes task forces to analyze issues related to etiology, treatment, and prevention of nutritional anemias.

A. Revitalizing Attention to Iron

The MGL project began with a new vision for INACG. The vision was for INACG to foster an interactive community for iron as IVACG had done for vitamin A. The first step was the formation of a new INACG Steering Committee in May 2000. INACG had steering committees in the past, but not for the extended period of time necessary to effect real change. As one of several strategies to revitalize international attention to iron, the steering committee decided to continue what had been tried in Durban: adding an INACG symposium to the IVACG meeting. The Hanoi symposium was planned

under the direction of the new INACG Steering Committee. A list of the INACG Steering Committee members during the life of the MGL project is included in Appendix A.

In Durban and Hanoi, it became apparent that the audience participating at the INACG symposia was nearly the same as the at the IVACG meetings. There was also a steady increase in the numbers of posters presented at the INACG symposia (23 posters in Durban, 38 posters in Hanoi, 79 posters in Marrakech, and 92 posters in Lima), indicating an increased demand for information on iron.

As part of INACG's revitalization efforts, it held a strategic planning session following the close of the INACG Symposium in Hanoi. The purpose of the strategic planning session was for INACG to gather feedback on its direction from other colleagues and organizations involved in the global effort to reduce iron deficiency and iron deficiency anemia. Of the sixty professionals invited to attend, thirty-nine attended the strategic planning session, in addition to the INACG Steering Committee members. The participants reflected UN Agencies, universities, bilateral and multilateral agencies, NGOs/PVOs, private industries, and other organizations involved with implementing micronutrient deficiency control programs. Prior to the strategic planning session, the secretariat conducted a survey among approximately 90 individuals identified as important to making a contribution to the task of redefining INACG's mission, including representatives of donor organization, iron and anemia experts, policy makers and program planners, as well as scientists from the food and pharmaceutical companies. Of the 90 questionnaires distributed, 40 were retruned. The results of the survey were used to spark discussion at the session. Survey respondents perceived that the most important barriers to effective iron programs were "not perceived as a priority" and that there is a "lack of knowledge about ID/IDA." The following four activities were given the highest rating as those that INACG should take up to address these barriers: 1) provide technical reports, 2) provide technical advice, 3) convene local small meetings on specific issues—presumably to address technical and programmatic issues and for advocacy, and 4) liaise with other sectors (industry, government, prevention of other nutritional deficiencies,

malaria, and helminth control). The strategic planning session was helpful in providing INACG with ideas on the direction it needed to take in order to reestablish itself as a leader in the micronutrient field.

B. Scientific Consultations and Programmatic Workshops

In May 2000, INACG and WHO, and with funding from USAID and the Edna McConnell Clark Foundation, sponsored a conference in Belmont, Maryland to reexamine the nature and magnitude of iron deficiency anemia as a public health problem. The participants at the conference undertook a multidisciplinary critical review process to redefine the nature of the public health problem of iron deficiency anemia on the basis of its link to functional outcomes in the human populations. The goal was to create a strengthened framework for programs and research aimed at global control of iron deficiency anemia that is guided by potential benefits to human health and development. The proceedings of the conference were published as a supplement to *The Journal of Nutrition* (131: 563S–703S, 2001).

INACG has recognized that an important element of a coordinated and integrated strategy for reducing the prevalence of anemia is the use of a strategic communication approach. To demonstrate this approach, INACG hosted a workshop in Cape Town, South Africa in September 2002 on the role of communication planning in comprehensive anemia control. The motivation for holding the workshop was the recognition that although technologies are available for controlling anemia, relevant organizations often do not work together to manage the interventions. Clearly, for an anemia control program to be effective, there must be collective ownership of the program by all those who can affect the outcome. This will be achieved only if there is cooperation and agreement on the public agenda for anemia control, the advocacy needed to develop and implement appropriate policies and programs, and the actions needed to promote a positive change in an enabling environment.

The communication workshop focused on Africa, and representatives from Ghana, Eritrea, and South Africa were invited. Participants set about defining the problems they face in implementing a comprehensive integrated plan of action for anemia control. Next, each country team developed a strategic communication plan specific to their country's needs to support the implementation of their integrated anemia control program. The framework developed at the workshop resulted in an INACG publication, "The Role of Communication in Comprehensive Anemia Control: A Framework for Planning and Implementing a Strategic Communication Plan." Subsequently, MOST, The USAID Micronutrient Program, received a grant through the MGL project to implement the Ghanaian plan developed at the workshop. A presentation highlighting lessons learned from the Ghana anemia communication program was presented at the INACG Symposium in Lima.

C. Future of INACG

During the MGL project, INACG was successful in providing visibility to and advocating for iron interventions. It produced a number of short publications to clarify confusing terminology and issues such as, "Anemia, Iron Deficiency, and Iron Deficiency Anemia" and "Efficacy and Effectiveness of Interventions to Control Iron Deficiency and Iron Deficiency Anemia" that were quite useful. Despite the progress made by INACG, important questions regarding iron interventions still remain. The results of the iron supplementation trials in Pemba and Nepal raised critical questions about the efficacy of iron supplementation in a non-malarious area (Nepal), and safety concerns in a malaria-endemic area (Pemba). The results of the trials were presented at several meetings including the INACG symposium in Lima, as well as discussed in depth at the IVACG-sponsored Innocenti meeting. As the MGL project comes to a close, leadership is needed to bring clarity to the field on these and other questions regarding iron interventions as a public health strategy remain. Despite its progress, and in the context of growing attention to multiple micronutrients, it is unclear what role INACG will play in providing leadership to answer these questions.

V. Expert Panel Consultations

Eight expert panel consultations were organized under the MGL project. The expert panel consultations served as a forum for convening experts in specific areas to examine and discuss solutions to key constraints facing vitamin A, iron, and other micronutrient deficiency control programs. Reports and publications arising from these meetings are listed in Appendices C and G.

Meeting	Location	Date
Harmonization of Methodologies to Assess Vitamin A Status Using Stable Isotope Techniques (IAEA)	Vienna, Austria	2–3 September 2004
NIH Meeting – Working Group Meeting to Develop an Initiative to Promote Integrated Research, Development, and Implementation in the Field of Nutrition and Health of Women of Reproductive and Pre-reproductive Age and Their Children	Washington, DC	25–26 January 2004
Retinol Stability Consultation - Consultation to Review Options for Improving Retinol Levels in Fortified Foods	Washington, DC	4–5 December 2003
WHO Consultation on Strategy for Optimal Fetal Development (Khanum)	Geneva, Switzerland	25–27 November 2003
Wellcome Trust Meeting – Workshop on Nutrition as a Preventive Strategy Against Adverse Pregnancy Outcomes	London, UK	30 July 2003
Setting Iron Concentration on Fortified Staple Foods and Complementary Food Supplements	Washington, DC	14 November 2002

Merton Meeting - Consultation on a Multidisciplinary Research Based Initiative on Mothers, Infants, and their Nutrition	Oxford, UK	18–19 July 2002
Boissungault Workshop on New Food-based Approaches to Achieve Micronutrient Adequacy in Complementary Feeding Technological Aspects	Paris, France	9–10 July 2002

VI. Targeted Operational Research

ILSI RF awarded 18 grants totaling $3,160,202 for operational research under the MGL project. A list of these grants is available in Appendix D. The grants originated with unsolicited research proposals that were sent to the MGL project and subsequently selected for a grant award. The majority of the grants were monitored by MGL consultant, Dr. Penelope Nestel, and often one or two other experts were invited to serve as reviewers and provide feedback to the investigators. Final reports were submitted by the investigator to the MGL project according to the guidelines included as Appendix E.

A. Major Research Topics

The research grants awarded under MGL can be loosely grouped into the following themes: Impact of Vitamin A Supplementation on Maternal Mortality in Ghana, Impact of Iron Supplementation, Women as Agents of Change, and Complementary Foods.

Impact of Vitamin A Supplementation on Maternal Mortality in Ghana

- A Randomized Double-blind Placebo Controlled Trial to Evaluate the Impact of Vitamin A Supplementation on Maternal Mortality in Ghana (ObaapaVitA Trial)
  P. Arthur, Kintampo Health Research Center, Ghana (deceased)
  S. Owusu-Agyei, Kintampo Health Research Center, Ghana

Sadly, Dr. Paul Arthur died suddenly in March 2002 during the course of this study. Dr. Seth Owusu-Agyei succeeded him as lead investigator of the study.

The Ghana ObaapaVitA trial is a collaborative study between the Kintampo Health Research Centre, Ministry of Health, Ghana and the London School of Hygiene and Tropical Medicine, with funding from USAID through the MGL project and from the Department for International Development (DFID) in the United Kingdom. It began under OMNI Research and was carried over to MGL. The trial itself started in December 2000.

The primary objective in initiating the trial was to evaluate the impact of weekly vitamin A supplementation to women of reproductive age (15-45 years) on maternal mortality, and to compare this with the impact on overall mortality. The three secondary objectives were:

1. To explore the possible causal pathways through which vitamin A supplementation might impact on maternal mortality.
2. To evaluate the impact of weekly vitamin A supplementation to women, before and during pregnancy, on perinatal and infant mortality.
3. To contribute data to a future meta-analysis exploring whether any impact of vitamin A supplementation on pregnancy-related maternal mortality is restricted to specific causes.

The trial attempted to replicate findings from a similar trial in Nepal. The design of the trial was that women, ages 15–45 years, would be given weekly supplementation with 700 µg of vitamin A or placebo for four years and followed for a range of morbidity endpoints and mortality, both pregnancy-related and non-pregnancy related. In June 2003, the Data Monitoring and Ethics Board (DMEB) for the trial concluded that the trial would not have sufficient power to reach a conclusive result on the impact of vitamin A on maternal mortality if fieldwork continued only until October 2005. They further concluded that fieldwork would need to be continued

through 2008 to achieve adequate power. Unfortunately, continued funding for the trial was not possible, and the trial was discontinued in late 2003.

- Ghana, Vitamin A, and Maternal Mortality "ObaapaVitA" Trial: Development of Infant and Neonatal Work Program: Phase 1
  B. Kirkwood, London School of Hygiene and Tropical Medicine, United Kingdom

  This study used data from the ObaapaVitA trial described above to develop a research program in neonatal and infant health that capitalizes on the potential of the ObaapaVitA trial in order to inform policy and programs to improve neonatal and infant health. The specific objectives of this study were to:

  1. To analyze data on newborns and infants routinely collected within the ObaapaVitA trial.
  2. To identify and develop new initiatives in newborn and infant health linked to the ObaapaVitA trial.
  3. To strengthen research capacity in perinatal and neonatal health.
  4. To report and disseminate findings to maximize their uptake by policy makers.

  Around 15,000 babies were born each year to women in the ObaapaVitA trial, and were followed to one year of age through the regular four-weekly visits to their mothers, thus providing a rich data resource concerning levels and determinants of perinatal, neonatal and infant health. These data are important because there are little accurate fully representative perinatal and neonatal data from rural areas in sub-Saharan Africa. In particular, births are often underreported, neonatal deaths are commonly incorrectly classified as stillbirths, and evidence concerning determinants and indicators of perinatal and neonatal health are lacking. In addition, as the ObaapaVitA trial included a surveillance system for infants throughout the first year of life, it provides an excellent opportunity to evaluate the impact on mortality of additional neonatal and infant health interventions.

The outputs of phase 1 of this study included: three papers concerning breastfeeding and other neonatal care practices, the first of which has just been accepted by *Pediatrics*, a report on cause of neonatal deaths, a proposal for a new trial of newborn vitamin A and an abstract presented at the International Nutrition Congress, Durban, September 2005.

The investigators proposed these next steps for phase 2 of the study:

1. Further analyses from the ObaapaVitA trial database, in particular: impact of delayed initiation of breastfeeding on cause-specific neonatal mortality, post-neonatal early infant mortality, and late infant mortality; impact of other newborn care practices on neonatal mortality; impact of access to health care on neonatal and infant mortality, and the determinants of socio-economic inequalities in neonatal mortality.
2. Modeling at a global level of the potential contribution of the promotion of prompt initiation of breastfeeding to neonatal and child survival.
3. Securing funding for and initiation of two new trials aimed at babies born within the ObaapaVitA trial: an evaluation of a large newborn dose of vitamin A delivered within 48 hours of delivery; and the development of a sustainable community-based approach to improving newborn care practices in rural Ghana and by so doing improve neonatal survival.

Impact of Iron Supplementation

- Meta Analysis of the Effect of Multiple Micronutrient Supplementation (including iron) on Hemoglobin Response in Children and Pregnant Women
  H. Sachdev, Maulana Azad Medical College, India

  Dr. Harshi Sachdev served as the principal investigator for three major meta-analyses of randomized controlled efficacy trials that considered the benefits of iron supplementation in children in each of the following areas: mental and motor development, hematological parameters, and physical growth.

The first systematic review studied the effect of iron supplementation on psychomotor development, cognition, mental development, intelligence quotient, and school performance in children. The review found that iron supplementation improves the global 'mental development score' but the effect is modest. This effect is particularly apparent for intelligence tests in initially anemic or iron deficient older children (above 5 years of age). The review found no convincing evidence that iron treatment has an effect on mental development in children below two years of age and on motor development.

The second of Dr. Sachdev's systematic reviews was designed to evaluate the effect of iron supplementation on hemoglobin and mean corpuscular volume (MCV) in children. The review found that iron supplementation results in a significant rise of hemoglobin and MCV in children. The rise is substantially greater in initially anemic subjects or those with lower baseline hemoglobin/MCV levels. The hemoglobin effect size is lower in malarial hyperendemic areas and substantially lower with fortification rather than oral medicinal supplementation. There is a suggestion that intermittent iron supplementation is effective in eliciting a hematological response, which for hemoglobin may be lower than that observed with daily dosing. Projections suggest that in children under 6 years of age, on an average between 37.9% and 62.3% (mean 49.2%) anemia is responsive to iron therapy; the corresponding figures for malarial regions being 5.8% and 31.8% (mean 22.2%).

The third of the systematic reviews was designed to evaluate the effect of iron supplementation on physical growth in children. It found that iron supplementation does not have a positive effect on the physical growth of children. There is a suggestion of a positive effect in malarial endemic areas and in older children (>5 years of age), and a negative effect in developed countries and with supplementation for six months or longer. Dr. Sachdev stated that, in view of the small sample sizes in the sub-groups and the possibility of false positives due to multiple comparisons,

these predictors of heterogeneity should only be viewed as exploratory requiring confirmation and not conclusive.

- Evaluation of Iron Status of Children in Presence of Infection: Effects of Iron Supplementation on Iron Status, Infection and Morbidity
  N. Ahluwalia, The Pennsylvania State University, USA

  This was a three-part study. The first part was a randomized, controlled, double-blind supplementation trial to assess the magnitude of iron deficiency and anemia in children with, or without infection, and also to determine the impact of iron supplementation on iron status and morbidity. The second part of this study used the iron status data from the study to identify a cutoff value for serum ferritin that indicates iron deficiency in the presence of infection. The third part of this study evaluated a filter paper based spot method for ferritin assay in children to simplify the process of collecting and processing blood samples in the field.

  The study included 453 children ages 5–10 that were outpatients in the Children's Hospital of Colombo in Sri Lanka. Children with clinical evidence of infection and elevation in 3 or more inflammatory parameters were included in the infection group (n=180), while those with no clinical or laboratory evidence of infection were included in the control group (n=184). There were 71 dropouts, and 12 children did not meet the inclusion criteria at baseline, and 6 subjects did not have baseline hemoglobin levels.

  The results suggested that iron supplementation resulted in an improvement in iron status of children with infection and without infection, and also caused a marked reduction in respiratory morbidity. This improvement in health status may result in improved school attendance and thus improve school performance and quality of life in young children.

The study found that the established cutoff value for serum ferritin had limited usefulness in detecting iron deficiency among children with infection. Various cutoffs were explored, but no clear cutoffs with high sensitivity and specificity emerged. The investigators concluded there was still a need to identify a cutoff value for serum ferritin which is adjusted for the effects of infection, yet indicative of iron deficiency.

The investigators found that dried serum spots on filter paper from both capillary and venous blood for ferritin determination were accurate methods for assessing iron status in the study population. Furthermore, capillary dried serum spots offered a practical means of collecting and processing blood samples in the field.

- The Role of Nutritional Supplements on Adaptive Immune Responses in Kenya
  E. Gershwin, University of California, Davis, USA

The study was based on the framework of the Global Livestock Collaborative Research Support Program project titled, "Role of Animal Source Foods to Improve Diet Quality and Growth and Cognitive Development in East African Children." The aims of the study were:

1. To determine if large scale immune assays could be done on very small volumes of sera.
2. To determine the presence of antibodies to common pathogens found in Kenya.
3. To determine if dietary supplements influence such antibody responses.
4. To determine the prevalence of antibodies to *H. pylori*.

The investigators were successful in showing that large numbers of immune assays can be performed on very small volumes of sera. The investigators predict that future assays can be done using sera from a heel stick or finger prick in pre-filled heparanized microtiter tubes. *H. pylori*, malaria, and rotavirus antibodies were found in 100% of the Kenyan school children population. Tetanus antibodies were found in

some, but not all Kenyan school children, signaling a disparity in immunizations, and approximately 50–70% of Kenyan school children have antibodies to hepatitis A—a prevalence compatible with poor sanitation. Despite evidence of anemia in this population, the children's immune response to these naturally occurring pathogens appears normal. The immune system is clearly protecting itself at the expense of other physiological compartments. There were no changes in these adaptive responses following dietary supplements. The presence of *H. pylori* was particularly important and suggests a means for therapeutic intervention.

- The Role of Nutritional Supplementation Adaptive Immune Responses to Local Pathogens in Ghana
  E. Gershwin, University of California, Davis, USA

  The Ghana study was similar to the above mentioned Kenyan study. The investigators found nearly a 100% prevalence of antibodies to *H. pylori* in populations of infants and young children in Ghana population. This is very high and has nutritional implications because of the reduced iron absorption associated with *H. pylori* infections. There was a 100% prevalence of antibodies to malaria in infants and young children, indicating that everyone had exposure and produced an antibody titer. Antibodies to tetanus were found in all infants and young children. Surprisingly, the titers were lower after dietary supplements. However, the sera were not matched and it probably reflected different children being studied. There were anti-complementary antibodies found in the sera of infants and young children that prevented adequate analysis of antibodies to rotavirus. Anti-complementary antibodies are found in many sera. The presence of these inhibitory factors prevents complement fixation assays from being performed. Hence, the data on the rotavirus assays could not be completed. Approximately 25–30% of infants and young children had antibodies to hepatitis A; these data reflected "reasonable" sanitation principles but suggests a need for improvement. Like the children from Kenya, their immune response to these naturally occurring pathogens also appeared normal, and protected itself at the expense of other physiological compartments. There were no

significant changes in these adaptive responses following dietary supplements. However, these data must be interpreted with caution because sera were not matched before and after. The presence of antibodies to *H. pylori* has implications for programs. It means that antibiotics may be helpful for therapeutic intervention in increasing iron absorption.

- The Use of Microencapsulated Iron and Vitamin A Supplements (Sprinkles) to Treat and Prevent Iron and Vitamin A Deficiency: Field Trial Proposal
  S. Zlotkin, Hospital for Sick Children, Canada

  The aim of this study was to compare the use of Sprinkles versus drops in the treatment and maintenance of anemia in three consecutive phases: treatment phase, maintenance phase, and follow-up phase. All three phases were conducted in Ghana following a single cohort of initially anemic infants over a 20-month period.

  In the treatment phase of the study, 837 anemic children (ages 6–18 months, hemoglobin 70–99 g/L) were enrolled for treatment with either ferrous sulfate drops or microencapsulated ferrous fumarate sprinkles for a period of two months. Of the 746 children who completed the study, 447 (59.9%) were successfully treated for anemia (Hb≥100 g/L) and consequently enrolled into the second phase of the study (maintenance of non-anemic status or prevention of recurrence of anemia). In the maintenance phase of the study, non-anemic infants were allocated to one of four groups ferrous sulfate drops, placebo, Sprinkles, or Sprinkles with vitamin A, for a period of 6 months. At the end of the intervention period, hematological status was reassessed to determine whether infants remained non-anemic. Those who remained non-anemic continued with no intervention, in their 'free-living,' high-risk environment, as they had prior to the treatment phase. A follow-up survey of these infants was conducted 12 months later from the end of the maintenance phase, to determine whether the effect of initial treatment and maintenance had a long-term effect.

Infants, who were successfully treated for anemia, required no further iron supplementation to maintain their non-anemic status in both the supplemented and placebo groups for at least a 12 month period following the recovery from anemia. The possible explanation for this surprisingly slow decline in hematologic status is a combination of limited exogenous iron needs after the first year of life, a small intake of dietary heme-iron and the ability to mobilize endogenous iron stores that were built up during the initial treatments phase. These results have important implications for iron intervention programs. Initial treatment is necessary because of a high prevalence of anemia, but subsequent iron supplementation to maintain a non-anemic status for the most part is unnecessary.

Women as Agents of Change

Two studies were supported by the MGL project that considered the role of women health care providers (WHCPs) as agents of change in nutrition interventions their communities. In many developing countries, WHCPs are the first point of contact in the community for those needing health care and they are expected to counsel on good nutrition and childcare. Yet, their own health and nutritional status and that of their families, may be precarious and little better than others in their community. It was the aim of these research projects to investigate the constraints WHCPs face in their role and identify ways of supporting them so they could be effective agents of change in the community. Drs. Alizon Draper and Andrew Hall, London School of Hygiene and Tropical Medicine, were hired as consultants to synthesize the findings from the studies done in Ghana and Uganda on WHCPs.

- The Role of Women Health Care Providers as "Change Agents" in Nutrition Interventions: Report of an Exploratory Study in the Eastern Region of Ghana
  S. Newton, MOST, The USAID Micronutrient Project, USA

  A cross-sectional study was undertaken that used quantitative and qualitative methods to investigate the characteristics of WHCPs in the Eastern Region of Ghana, their

nutrition knowledge and current roles, and views on how their effectiveness could be improved. WHCPs were defined as all female health practitioners in the formal health service.

The study found that the WHCPs did have some knowledge of the causes and consequences of malnutrition which they put into practice in their own homes, but they did not identify nutrition as the most important health problem in the community.

In interviews, the WHCPs indicated that they had little access to training and what training there was rarely focused on nutrition. They also complained of a lack of resource materials to undertake nutrition activities. To improve their performance they wanted more staff, more nutrition training and more resources. Their thoughts were echoed by public health officials and key informants in the community and there was general agreement that to improve WHCP effectiveness, the 'tools of the trade' were essential, be they physical resources, technical knowledge or logistical supports.

- Improving Health and Nutrition of Community Women Health Providers to Enable Them to Be a More Effective Agent of Change
  J. Jitta, Makerere University, Uganda

  This study investigated the hypothesis that empowering WHCPs will improve their performance in health promotion and improving the health status of them and their families will make them role models for the community, thus encouraging others to improve their situation. WHCPs were defined as women outside the formal health service who had already received some form of health or community development training.

  The study was participatory and worked in partnership with the WHCPs, community members, community-based organizations, the local government, agricultural extension workers and health facility staff.

A baseline survey found that the situation of the WHCPs was similar to the rest of the community and that both had pressing health needs. Most WHCPs were subsistence farmers or operated small scale businesses and some had homes in a poor state of repair. The WHCPs felt that their poverty and the poor state of their homes constrained them the most in their roles as health providers.

The project interventions for the WHCPs aimed to address the factors that limited their performance as health providers and make them community role models. They provided practical training and resource materials, gave grants and technical support for income generation projects, including pig rearing, gave grants and support to improve hygiene and sanitation in WHCP homes, and they provided beta-carotene rich sweet potato vines to improve food security. The project also provided community grants and the WHCPs worked with their respective communities to identify what the grant would be spent on. In addition, the project provided support and encouragement to the WHCPs throughout and facilitated the formation of informal networks amongst them and formal networks with other community resources, such as agricultural extension workers.

Case studies, quantitative monitoring data collected by the WHCPs and qualitative interviews and observations were used to evaluate the project process and outcomes. The practical training the WHCPs received, coupled with the experience they had of undertaking their own home improvements and income generation activities resulted in a substantial increase in their self-confidence. As the communities witnessed the WHCPs improving their homes, incomes and food security their recognition and trust of them improved and they began to attempt to emulate them.

It is fair to conclude that the participatory approach and activities of the project led to an empowering process for the WHCPs that saw their social status and credibility enhanced, tangible improvements for them and their communities, and an increased

capacity as health providers. The short time scale of the project, however, limited evaluation of the sustainability of these changes.

- Inputs to Women Health Care Provider Projects
  A. Draper, A. Hall, London School of Hygiene and Tropical Medicine, United Kingdom

  A number of common findings emerged from the two studies. First, poverty is a major constraint to WHCP effectiveness. The effect of endemic poverty was felt by both groups of WHCPs and was the cause of low wages in Ghana and food insecurity and poor home situations in Uganda. In short, it sapped the women's motivation to be effective health providers. In both settings, the women were concerned about gaps in their skills, training and resources. The resources or 'tools of the trade' included education materials, basic equipment and logistical factors. The importance of networks also emerged from the studies, particularly in Uganda where informal networks between WHCPs provided them with moral support and more formal networks with technical personnel provided practical assistance when needed. Finally, the personal attributes of the WHCPs emerged as an important factor from the perspective of the communities—they appreciated a health provider who was kind and tolerant.

  These findings carry a number of implications. First, while there were parallels between the two studies, a situation analysis is an important starting point in understanding the context specific constraints facing WHCPs. Second, the provision of adequate and practical training is clearly a priority for WHCPs, but it should not be seen as a one-time activity. Rather, it needs to be regularly refreshed and WHCPs need the right resources and to be supported whilst they put their new knowledge into practice. Finally, the establishment and encouragement of networks to provide technical assistance and moral support for WHCPs should be considered by those with responsibility for WHCPs.

A final methodological point to arise from these studies is the value of combining qualitative and quantitative methods. The data generated complemented each other and the qualitative methods provided a deeper insight into the WHCPs' lives and roles from their perspectives. In Uganda, in particular, the qualitative methods were invaluable in understanding the process of empowerment that underpinned the project.

- Prevention of the Negative Behavioral Effects of Iron Deficiency in Mothers
  J. Beard, The Pennsylvania State University, USA

  The aim of this study was to assess the impact of iron deficiency anemia on the cognitive and behavioral performance of mothers, the interaction with their infants and the infant's development. The principal hypothesis tested in this project was that maternal iron status has a significant impact on the interactions that occur between mother and child. In order to test this hypothesis the chief dependent variables measured were: maternal emotional status, mother-child interaction, maternal cognitive status, and infant development.

  This prospective randomized double-blind intervention study included three groups of mothers: a non-anemic control group and two anemic groups (one on placebo and one on iron therapy). The mothers were enrolled in the study within the first month of birth of the infant and continued in the intervention trial for 6 months. The assessment of iron status, socio-economic variables and general intelligence (Ravens test) was done at the first visit, which was 6 weeks postpartum. Mothers were randomly assigned to one of the three groups when they returned four weeks later. At this visit cognitive functioning, the emotional characteristics of the mothers, the quality of the mother-child interaction, and the physical and psychological development of the infants were assessed. Daily oral iron supplements or placebos were provided and mother-infant dyads were followed for 6 months. All tests of mothers' emotional and cognitive status, mother-child interactions, infant development, and iron status were reevaluated at the end of the trial.

Though highly significant differences were not found in *all* cognition or emotion measures between the anemic mothers and the control mothers at baseline, the regression analysis provided evidence that there is a strong relationship between iron status measures and measures of depression, anxiety, and cognition. Mothers that remained iron deficient during the intervention trial performed significantly worse at 9 months in emotional measures, while mothers who responded to the iron supplement showed significantly less depression and anxiety than their anemic counter-parts. Mother-child interactions were also strongly influenced by maternal iron status as well as a number of social and economic variables.

Infants of anemic mothers showed significantly delayed development compared to infants of control mothers in the Griffith's developmental test at 10 weeks and at 9 months despite birth weights, gestational ages, etc. being similar. Children from all the three groups showed a decline in their growth parameters over the 6 months of involvement in the iron intervention trial.

The main recommendations from this study were that mothers be screened and treated for iron deficiency anemia in pregnancy and post-partum. The investigators concluded that infants of mothers who suffer from iron deficiency anemia are likely to suffer from poor development. The iron deficient mothers are likely to have more depression that increases the risk of abnormal infant development. These mothers are in need of active screening and treatment and should be developmentally assessed so that early and appropriate interventions are implemented.

- Community Interventions to Improve Child Survival in Rural Nepal: A Cluster Randomized Controlled Trial of the Impact of Women's Groups on Neonatal Mortality, Stillbirths, and Maternal and Infant Nutrition
  A. Costello, Institute of Child Health, United Kingdom

This cluster randomized controlled trial aimed to evaluate community interventions to improve child survival in rural Nepal. Specifically, the study was designed:

1. To evaluate the impact of a participatory intervention with women's groups on neonatal and infant mortality.
2. To evaluate the impact on maternal and infant nutritional status of the inclusion of diet as an issue for discussion in women's groups.
3. To evaluate the additional impact of training of community volunteers in the recognition and management of neonatal sepsis.

Unfortunately, the security and political situation in Nepal deteriorated significantly since the start of the project, and caused delays to progress. Fortunately, the political situation became more stable and project activities were able to resume quickly. The trial is set to begin in March 2006.

Assessment

- Assessment and Determination of Biomarkers of Inflammation in Urine
  F. Rosales, The Pennsylvania State University, USA

The overall purpose of this project was the assessment of a marker of inflammation in urine samples. To accomplish this goal the study design included the recruitment and enrollment of patients with acute respiratory infection and their subsequent follow-up for two consecutive weeks. At each of these times, patients provided blood and urine samples for the analytical determination of acute phase proteins.

Ten males and seven females with acute respiratory infection (ARI) were recruited and followed for two weeks. These patients were ambulatory and most of them had mild upper respiratory infections. During the acute phase of infection, these patients had significantly high serum concentrations of acute phase protein (APPs) like C-reactive protein (CRP), alpha-1-acid glycoprotein (AGP), and alpha-1 antichymotrypsin (ACT). The concentrations of these proteins decreased

significantly at 7 and 14 days after, but their dynamics differed from each other. CRP declined abruptly, whereas decline of AGP was gradual. ACT showed little response during the acute phase of infection. Because of their specific dynamics, it was necessary to use two serum APPs in the diagnosis of inflammation. CRP indicated the acute effect of inflammation, whereas AGP the follow-up of the inflammatory response. Serum retinol was decreased significantly during infection compared to convalescence and its transport proteins like retinol-binding protein (RBP) and Transthyretin (TTR) paralleled retinol dynamics from acute to convalescence.

Urinary AGP increased three fold during the acute phase of infection compared to 7 and 14 days after. A sensitivity and specificity analysis of urinary AGP versus the combination of serum CRP or AGP showed 77–75% sensitivity at acute infection and at 14 days after, respectively, and a specificity of 100–90%, respectively. The collection of urine samples required no invasive or painful procedures, and small volume of urine, 15 µl, was necessary to measure AGP by radial immunodiffusion. These results showed that urinary AGP can be a low cost and user friendly method of diagnosing inflammation in field trials.

- Assessment of "Dried Filter Paper Serum-Spot Method" for Measurement of Soluble Transferrin Receptor (sTfR) to Assess Iron Status in a Field Study of Iron Deficiency Anemia in Infants in the Kintampo Region of Ghana
  S. Zlotkin, Hospital for Sick Children, Canada

  The aim of this study was to test the dried filter paper serum-spot method for sTfR compared to the traditional and logistically difficult method of storing frozen samples in a tropical field setting in Ghana. This study was the first of the investigators' knowledge to test the utility of the spot method under field conditions. Previous studies have shown that under ideal laboratory conditions, spotted and dried samples can be stored with a desiccant at either standard refrigerator temperature (4°C) or room temperature for a period of one month without significant loss of

immunoactivity of ferritin or sTfR when compared to serum samples stored frozen and analyzed using the traditional method.

The investigators faced challenging field conditions including high heat and humidity, and time constraints including spot air-drying time. They concluded that the diagnostic value of the blood spot sTfR versus the frozen sera samples are limited on two levels:

1. There are no well-established cutoff values for tfR defining iron deficiency for infants. However, different TfR kits publish their normal ranges for adults, which would allow TfR to be used diagnostically.
2. The results of the current study suggest that the percent recovery from the spot samples will change under different environmental conditions. Thus, even in adults, the spot samples would underestimate the frozen samples to varying degrees depending on the environment of the field site.

For these two reasons, the investigators concluded that the spot method would not provide a good diagnostic measure of iron deficiency. However, the spot sTfR samples do correlate well with the frozen samples, therefore relative differences remain constant. This suggests that spot samples are useful to compare changes in sTfR values in different treatment groups within a study where the environmental conditions are consistent. Although the use of dried serum spots offer significant advantages over the traditional method of using frozen blood samples, particularly in under-developed regions, results from this study suggest that further refinement of the methods are needed before spot samples for determination of sTfR can be routinely accepted. The use of a desiccator rather than air-drying is a possible solution. Further studies in different field settings may answer the methodological questions that remain.

Complementary Foods

- Comparison of the Efficacy and Acceptability of Three Types of Micronutrient Supplements Added to Complementary Foods for Infants in Ghana

K. Dewey, University of California, Davis, USA

This study compared of the efficacy and acceptability of three types of micronutrient supplements added to complementary foods for infants in Ghana. The study began in July 2003 and field work was completed in April 2005. Laboratory analysis of blood samples is in progress, and statistical analysis and report writing are about to begin.

In all, 409 children were involved in the study, in both the intervention groups and the non-intervention group. For the intervention groups, 313 children were enrolled in a recruitment process that lasted about 8 months (February–September 2004). During follow-up, 15 children dropped out and 298 children graduated after 6 months of intervention. All the micronutrient supplements needed for the intervention ("Sprinkles" from Canada, "Nutributter" and "Nutritabs" from France) were successfully acquired and distributed. For the non-intervention group cohort, 96 children were recruited between August 2004 and April 2005. Analysis of the plasma samples for CRP, TfR and Ferritin was completed in Ghana in June-August 2005. Analysis of erythrocytes for riboflavin, which is currently underway at University of California, Davis, is about 70% complete. It is expected that the rest of the laboratory analysis (plasma vitamin B6, zinc, retinol and essential fatty acids) will be completed in late 2005/early 2006.

- Mumbai Maternal Diet Study
  R. Potdar, Centre for Study of Social Change, India

  MGL funds were used to take the Mumbai Maternal Nutrition Project to scale in Mumbai, India. Other project funders included the Wellcome Trust, the Parthenon Trust, and ICICI Ltd. The project uses a food supplement made with locally available foods designed to improve fetal development and thus the long-term health of the babies born within it. The intervention has strong development potential in that it supports local agriculture, and (in the production of the finished supplement) provides a training and income-generating activity for local women.

Development has another meaning in this study, because the supplement is designed to improve the fetal development and thus the long-term health of the babies born within it—as far as we know this is the first project set up prospectively to test the "Developmental Origins of Adult Health and Disease" (DOHaD) hypothesis—which proposes that improvements in maternal nutrition and fetal development will lead to fundamental improvements in the capacity of the baby to cope with adverse environments throughout its lifecycle, and thus resist common chronic diseases of adult life such as hypertension, diabetes and cardiovascular disease. Enabling long-term follow-up of the children was a major consideration in the study design. The expansion study will begin in January 2006, and will continue for five years.

- Self-sustaining Community-based Effort to Improve Child Nutrition in Tamilnadu, India
  L. Rahmathullah, Family Health & Development Research Services Fund, India

  The Tamilnadu Integrated Nutrition Program was initially designed to provide a low-cost nutritional supplement in the form of a weaning powder composed of locally grown foods high in protein and calories. The program was expanded to fortify the powder with multiple micronutrients. The program was designed to be sustainable through a cost-recovery system: the first two months of the weaning powder production was subsidized, after which it was expected that the cost would be recovered from prior net sales. The study evaluated various approaches for involving the community in the development of the product, and in creating demand for the product.

  The investigators found that providing information on the impact of poor nutrition on the life and finances of the family was useful in encouraging the families to use the powder. Specifically, they found that families found value in information about how poor nutrition impacts education of children. They also found that involving men and highlighting their interests, such as disturbed sleep, loss of money through fees to

doctor's visits, and not being able to work to full capacity the next day, was a good motivator to get men involved in making positive nutrition decisions for the family. In conclusion, the investigators found that they can develop the program, provided that it is a local venture, and it is kept small in scale.

- Karen Food Supplementation Intervention
  S. Smitasiri, Mahidol University, Thailand

  This research project was designed to better understand the vulnerability of the Karen, an indigenous population in the west near the border between Thailand and Myanmar. This 2.5 year project is still ongoing. Its main objective is to understand the traditional food systems of the Sanepong community in order to use this knowledge to improve the health and nutrition, particularly micronutrient nutrition, of children 0–12 years old and their care providers through better utilization of their own foods. The specific objectives are:

  1. To study the ecology, culture and nutrition of the indigenous food systems in Sanepong community in western Thailand.
  2. To identify the nutritional values of frequently used and/or potentially good nutrient local food resources and their environmental sustainability.
  3. To develop appropriate, long-term participatory, community-based dietary improvement strategies and implementation which can, in part, provide feasible and sustainable solutions for overcoming micronutrient malnutrition and improving health and nutritional well being among children under 12 years of age and their care providers' in the Sanepong community.
  4. To analyze, synthesize, document, and disseminate lessons learned from the project at national and international levels.

  Based on this first year of the study, it is clear that Sanepong children, pregnant and lactating mothers need improvement in their diets. This improvement can certainly build upon the community's available food sources, except for iron nutrition. It is also essential to work with mothers on care practices. In addition, mother and child

interaction is critical as it is related to the increase of snack consumption among the children.

In the short-term, school intervention with an emphasis on nutritious local and modified traditional dishes should be most feasible. These interventions should be participatory and educational by design with significant involvement of the locals in all stages of the intervention.

For the medium-term, community intervention is necessary. However, this intervention will not be possible without significant inputs from local opinion leaders and change agents. Unlike indigenous peoples in developed nations, the Karen in Sanepong have been living with high insecurity since 1974 when the Thai government established the Thung Yai Naresuan National Park in order to preserve the wild life animals and forest resources. Throughout the years, there is constant tension between community people and local forest officers, as the locals do not agree to move to a newly established location as suggested. This situation makes it difficult for the locals to trust outsiders. Continuous migration of the Karen across the border from Myanmar through this community has also made the government on high alert for security issue. Thus, community intervention can be complicated, especially considering that interpersonal communication seems to be the best means for change. Further insight into these issues is necessary to achieve appropriate changes in this community. During this first year of the study, significant time was required to build trust. Without trust and knowledge of the complex problems facing the community, it is unlikely that any interventions will result in significant improvement.

In the long-term, it is clear that Sanepong is facing many challenges. According to community leaders, food insecurity will be a major problem in the next 20 years if the population continues to grow at the current pace, and the people still practice the same farming methods. Given this context, a holistic development approach with an emphasis on appropriate cultural development is urgently needed.

B. Papers Written on the Cooperative Agreement or Its Individual Components

In addition to the publications listed in Appendix C, other publications and presentations based on MGL activities are listed in Appendix G. As many of the studies funded by MGL have finished in the past few months, it is reasonable to expect this list to continue to grow for some time to come.

C. Other MGL Grants

In addition to research grants, MGL awarded grants to carry out specific functions such as the development of a publication to highlight ongoing work in nutrition in development, or the development of state-of-the-science literature reviews on subjects of interest to USAID, such as infant and young child feeding. Seven grants of this nature totaling $874,953 were awarded.

- USAID Funding Support to HarvestPlus for: (1) IUNS session on biofortification and fortification, (2) consultation on designs for measuring the effectiveness if nutrition interventions, and (3) literature review and development of a policy model for estimating the cost of vitamin A supplementation (2/1/05–9/20/05)
  Howarth Bouis, HarvestPlus Program

- Implementation of Ghana Strategic Communication Plan for an Integrated Anemia Control Program (5/1/03–9/29/04)
  Nihal Goonewardene/ Vicky MacDonald, MOST

- WHO Regional Consultations in Support of the Development of a Strategy for Promoting Optimal Fetal Growth and Development (7/04–12/31/05)
  Sultana Khanum, WHO

- USAID Funding Support to the Publishing of the 5th World Nutrition Situation and SCN News (5/1/01– 3/31/03)
  Sonya Rabeneck, SCN

- Micronutrient Activities to Achieve Millennium Development Goals (5/1/05–9/1/05)
  UNICEF (U.S. Fund)

- Nutrition in Development Field Publication and Network (4/1/05–9/20/05)
  Fiona Watson, Nutrition Works

- A Review of the State of Current Knowledge of Micronutrient Deficiency Diseases and the Prospects for Future Programs (5/10/04 – 8/30/04)
  Andrew Hall, consultant

- A Review of Nutrition and Feeding of Infants and Young Children in Developing Countries (9/12/05 – 9/20/05)
  Andrew Hall, consultant

VII. Information Dissemination

A. Overview

The primary goal of the publications program under the MGL project was to provide up-to-date technical information to professionals working in areas related to the control of micronutrient deficiencies. The secondary goal was to demonstrate that USAID's investments in activities to control vitamin A and iron deficiencies are being widely disseminated to policy makers, programmers, and researchers working in related topics.

Most of the technical information provided under the MGL project took the form of monographs and short statements that summarized the evidence base and/or state-of-the-art in micronutrient deficiency control. When an important programmatic gap was identified, guidelines were developed (e.g., Anemia Communications, Hemocue Manual). The audience for MGL publications has varying levels of interest and expertise on the subject of vitamin A and iron deficiencies and may have used the information in several different ways, for example, for developing policy, designing and implementing programs, educating other professionals, and carrying out research.

With the aim of making the information widely accessible to its audience, single copies of MGL publications were offered free of charge to individuals in developing countries. Individuals in developed countries were charged $3.50/per document with their order. Postage and handling charges were absorbed by the project regardless of the distance the shipment traveled or the size of order.

Email announcements and postcards concerning new publications were disseminated through the IVACG and INACG mailing lists, which includes over 4,000 contacts around the world (of which about 2,500 emails are recorded).

B. Audience analysis

The MGL project disseminated a total of 22,800 publications over its 7 years. Tables 1 and 2 detail publications distributed by geographic region and organization type. The majority of publications (23%) were sent to West and Central Africa. Of the various organization types that ordered publications, universities and training institutes ordered the largest percentage of publications (33%). The data on publication orders was recorded in three different database software programs over the life of the project. Some of the data in the earliest database (1998-1999) were unrecoverable and account for the unknown/other category.

C. Publications dissemination through the internet

Publications produced under the MGL project were routinely posted as PDF files on the IVACG (http://ivacg.ilsi.org), INACG (http://inacg.ilsi.org), or MGL (http://hni.ilsi.org/MGL) websites. Respondents to the publications survey (see below) frequently obtained their most recent MGL publication by downloading it from one of the websites (38%) versus ordering a copy through the secretariat (23%) or borrowing a colleague's copy (17%). However, 20% of those that had downloaded a publication from the web site felt that download time of publications was only "fair." This is an area that could easily be improved by posting smaller size PDFs on the website, and breaking up large files into several smaller files when necessary.

D. Partnering with other institutions

Several publications produced under MGL were developed jointly with, or received financial or in-kind support from partner organizations. Often, this type of partnering helped to reduce the cost of the publications, provided a mechanism for wider promotion and dissemination, and improved the credibility of the publications by benefiting from a wider consensus during its development. Examples of partnering with other institutions on publications are listed below.

Helen Keller International (HKI) saw a demand for the IVACG statement, "The Annecy Accords to Assess and Control Vitamin A Deficiency: Summary of Recommendations and Clarifications" to be available in other languages and translated it into French, Spanish, and Portuguese at no cost in exchange for a supply of copies which they disseminated to their field staff and partners. HKI also translated the INACG publication, "Anemia, Iron Deficiency, and Iron Deficiency Anemia" into Portuguese free of charge. Similarly, the International Atomic Energy Agency (IAEA) translated the INACG publication "Efficacy and Effectiveness of Interventions to Control Iron Deficiency and Iron Deficiency Anemia" into French at no cost in exchange for 100 copies which they disseminated to their staff and partners.

INACG partnered with the Pan American Health Organization (PAHO), ILSI, and USAID to produce the publication, "Iron Compounds for Food Fortification: Guidelines for Latin America and the Caribbean (2002)." The publication was an outcome of a technical consultation to review and discuss the state-of-the-art information on iron compounds for food fortification and to determine a set of guidelines for iron fortification programs in the region of the Americas. The English version of the publication was published as a journal article (Nutr Rev 2002 Jul; 60(7) [II]S50-S61). PAHO translated it into a stand-alone Spanish publication.

MGL partnered with HKI to adapt material from the HKI manual, "How to Assess Iron Deficiency Anemia and Use the HemoCue™." The adaptation was released by MGL as a stand-along publication, "A Procedure to Estimate the Accuracy and Reliability of HemoCue™ Measurements of Survey Workers" aimed at managers of programs and surveys that use or intend to use the HemoCue™ to collect hemoglobin measurements to determine the prevalence of anemia.

HarvestPlus and IAEA partnered with MGL to produce the publication, "Appropriate uses of Vitamin A Tracer (Stable Isotope) Methodology." This publication is an outcome of a workshop on the same topic organized under the MGL project.

Task Force SIGHT AND LIFE provided generous financial contributions to the publication of several IVACG meeting reports throughout the course of the MGL project. All of the IVACG meeting reports produced under MGL benefited to some degree from a financial contribution from Task Force SIGHT AND LIFE.

Finally, prior to printing a new publication, the MGL project always contacted UNICEF to see if they would like a supply of publications free of charge (up to a maximum of 500 copies) to distribute to the field office staff. UNICEF frequently accepted this offer, providing an effective means of getting the short policy statements into the hands of policy makers and managers in key decision making roles regarding programs.

E. Publications survey results

To determine the relevance and usefulness of the publications to MGL readers' work, an electronic survey was conducted from 2 August–30 September 2005. Out of the 2500 people that received the online survey, 492 (20%) responded. The full survey is available as Appendix H.

About the survey respondents

Most respondents (33%) worked at a university or a training institute, and held positions as professors or lecturers (25%). The highest percent of respondents (33%) worked in Latin America and the Caribbean (LAC). We suspect that part of the reason there was a good response from the LAC region was because an IVACG meeting was recently held in Peru in late 2004 and was still fresh in the memory of those that received the survey in this region.

Overall satisfaction with MGL publications

The majority (87%) of respondents had read or used a publication from the MGL project in the past (including IVACG and INACG). Publications were consistently rated positively ("good" or "excellent") in the following aspects: clarity (97%), technical quality (96%), presentation (94%), length of publication (87%), cost (70%), and accessibility—how easy publications are to obtain (71%). Upon examination of the open-ended comments that followed this question, it is apparent that the cost question should have included a "not applicable" response option; some respondents did not know how to respond to this question, as most of the publications are available free to readers in developing countries and they had never paid for a publication before. Because the cost of the publications is already low, it is difficult to imagine improving on the cost other than offering them free to charge to everyone. It is also important to draw attention to the aspect that received the lowest rating—though still high at 70%—access. Based on the

open-ended comments that followed these questions, it appears that readers would like to see the publicity of our publications improve.

Space was provided after the question about satisfaction with aspects of MGL publications for additional comments; 78 respondents provided comments. The full comments are available in Appendix I1. The comments can be grouped into the following subjects (the number in parenthesis is the actual number of respondents):

Positive Feedback: 31% (24)
Access: 19% (15)
Cost: 13% (10)
Technical quality/suggestions: 10% (8)
Length: 4% (3)
Presentation: 4% (3)
Language: 3% (2)
Miscellaneous or N/A: 17% (13)

In response to a question about making MGL publications in languages other than English, surprisingly, a slight majority of respondents voted that they would not like to see these publications in other languages (57%). Of those that would like to see publications in other languages, Spanish was most often picked as the language that would be most useful (65%), likely a reflection of the high representation of respondents from the LAC region.

Obtaining MGL publications

In response to a question about preference of the format of publications (hard copy or PDF download from the internet, or both), most respondents found both formats equally useful (49%), followed by preference for PDFs (34%), and hard copies (16%). More respondents obtained their most recent MGL publication by downloading it from the website (38%) versus ordering a copy through the secretariat (23%) or borrowing a

colleague's copy (17%). However, 20% of those that had downloaded a publication from the web site felt that download time of publications was only "fair." This is an area that could easily be improved by posting smaller size PDFs on the website, and breaking up large files into several smaller files when necessary. Other common ways readers obtained their most recent copy of an MGL publication was by automatically receiving a copy by post mail (10%), and at a conference or meeting (7%). In retrospect, it would have been helpful to include a question that looked at what impact is made through the secretariat's routine practice of offering large quantities of new publications to UNICEF for dissemination to their field offices; a future survey should consider this question.

Use of MGL publications

When asked for the title or topic of the most recent MGL publication readers had used, the top three titles given were the IVACG/INACG programs or reports from Morocco and Peru, and *Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia (INACG/WHO/UNICEF)*. However, many respondents were not able to remember a title, and provided the general topic area instead. The full responses are available in Appendix I2. Respondents' most frequent use for their most recent MGL publication was as a reference (27%). Most respondents found their last publication to be very helpful (48%) or helpful (43%) in their use for it.

Publicity of new publications

Overall, respondents found email announcements, receiving a complimentary copy in the mail, and receiving a publication as part of a meeting exhibit or in their meeting materials as the most helpful ways learn about new publications in their fields, in that order. Website announcements, newsletter announcement or review, recommendation from a colleague, news release, and postcard announcements scored lower, in that order. Respondents mentioned WHO/UNICEF, the internet, and PubMed as additional ways they like to learn about new publications.

Future topics and additional comments:

When asked for what new topics they would like to see covered in future MGL publications, 201 readers responded. The full responses are available in Appendix I2. After review, the responses seemed to fit into several categories. The following are the most frequently mentioned categories:

Food general/Carotenoids/Bioavailability: 12% (25)
Multiple Micronutrients/Micronutrients other than VA, Fe: 10% (20)
Infectious Diseases: 8% (16)
Food fortification: 7% (15)
Program-oriented Topics: 7% (15)

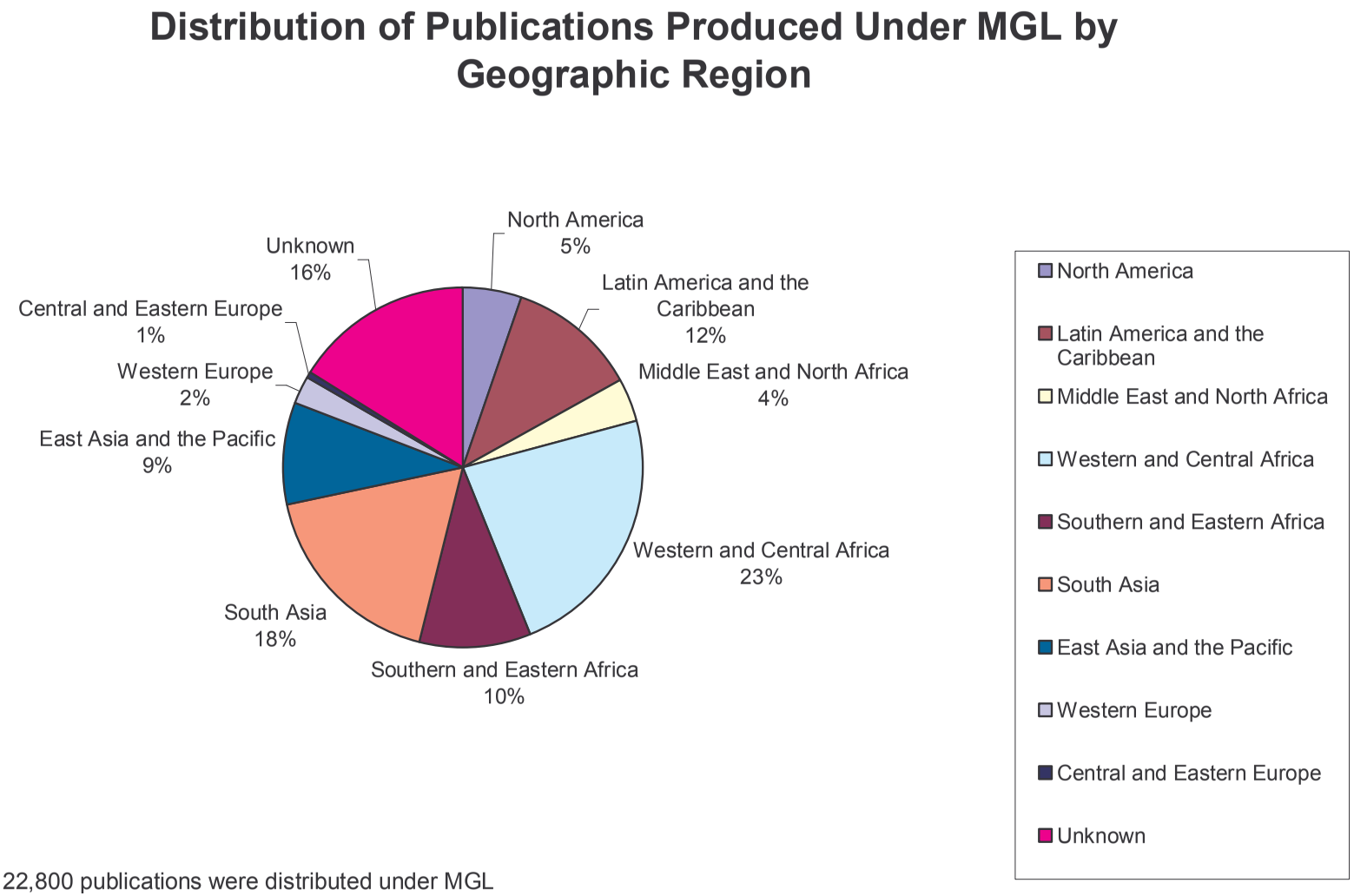
The final question on the survey provided space for any additional comments; 93 readers responded. The full comments are available in Appendix I4. Again, after review, the responses seemed to fit into the following categories:

Positive feedback: 44% (41)
Comments related to access to publications: 18% (17)
Suggestions for additional topics: 16% (15)
Requests to be added to the mailing list: 9% (8)
Comments related to IVACG meetings: 9% (8)
Suggestions to invite additional experts: 2% (2)
Policy-oriented comments: 2% (2)

VIII. Fiscal Report

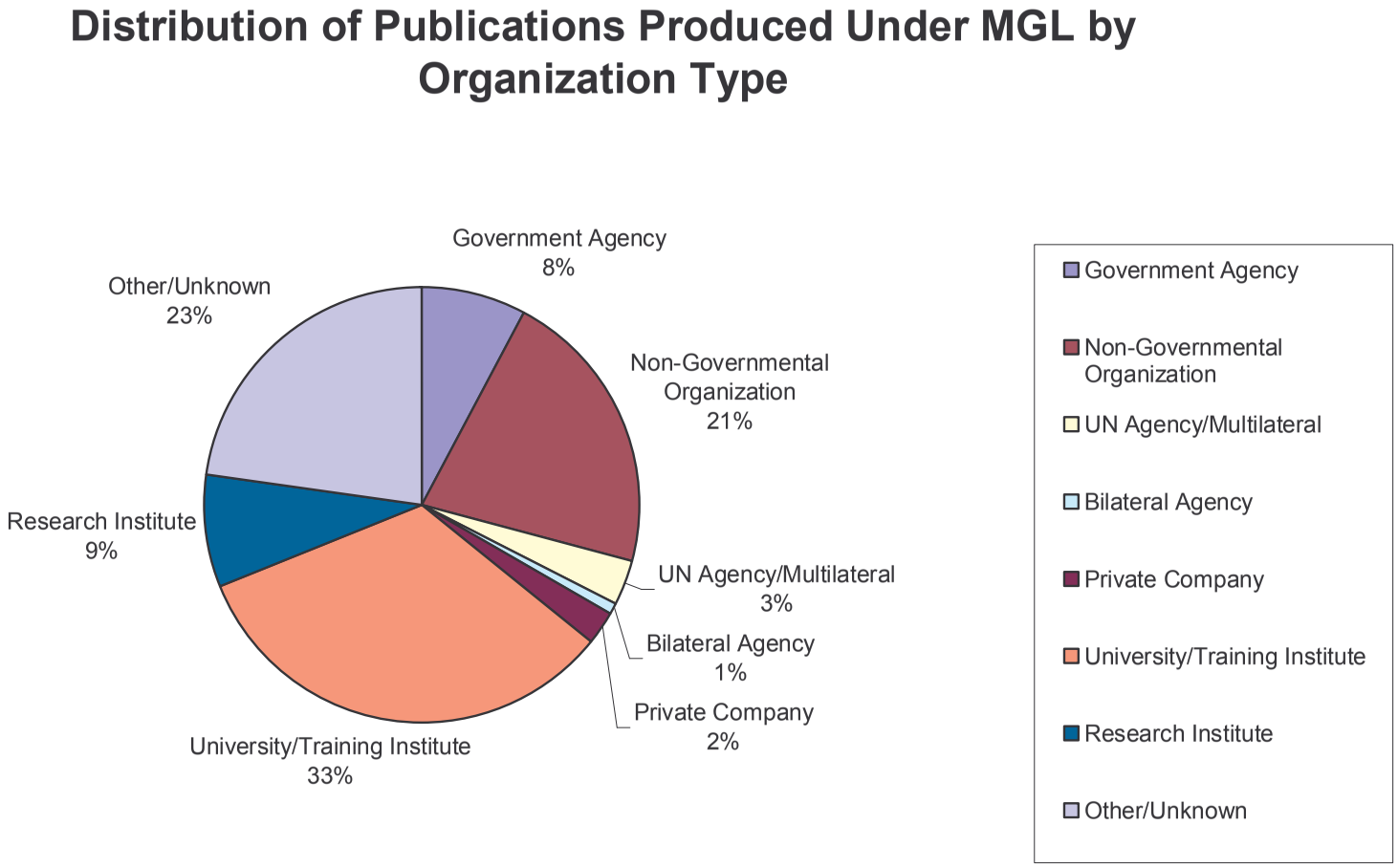
A final financial status report (SF 269A) was submitted to the appropriate individuals within USAID.

Figure 1



A total of 22,800 publications were distributed under MGL

Figure 2



A total of 22,800 publications were distributed under MGL

Appendix A

IVACG and INACG Steering Committees

IVACG Steering Committee members from 9/29/98–9/28/05

Dr. David Alnwick, March 1996 – present
Dr. Paul Arthur, March 1996 – March 2002 (deceased)
Dr. Zulfiqar Bhutta, March 2004 – present
Dr. Omar Dary, November 1997 – present
Dr. Frances Davidson, 1987 – present
Dr. Abraham Horowitz, 1988 – July 2000 (deceased)
Dr. Chewe Luo, October 2003 – present
Dr. Luis Mejía, October 1998 – N/A
Dr. Vinodini Reddy, December 1989 – August 2001 (retired)
Dr. Suttilak Smitasiri, March 1993 – present
Dr. Alfred Sommer, October 1984 – present
Dr. Kraisid Tontisirin, April 2002 – December 2005
Dr. Clive West, November 1998 – August 2004 (deceased)
Dr. Keith West, March 1993 – present

INACG Steering Committee members from 5/00–9/28/05

Dr. Suniti Acharya, May 2000 – 2001
Mrs. Rosanna Agble, August 2003 – present
Dr. John Beard, May 2000 – May 2003
Dr. Frances Davidson, May 2000 – present
Dr. Lena Davidsson, May 2000 – present
Dr. Eva Hertrampf, May 2000 – May 2003
Dr. Marian Jacobs, May 2000 – March 2003
Dr. Sean Lynch, May 2000 – present
Dr. H.P.S. Sachdev, August 2003 – present
Dr. Rebecca Stoltzfus, May 2000 – present
Dr. Olivia Yambi, October 2001 – December 2003

Appendix B

IVACG and INACG International Meetings and Symposia

IVACG International Meetings

- XXII IVACG Meeting "Vitamin A and the Common Agenda for Micronutrients," 15–17 November 2004, Lima, Peru.
- XXI IVACG Meeting "Improving the Vitamin A Status of Populations," 3–5 February 2003, Marrakech, Morocco.
- XX IVACG Meeting "25 Years of Progress in Controlling Vitamin A Deficiency: Looking to the Future," 12–15 February 2001, Hanoi, Vietnam.
- XIX IVACG Meeting "Vitamin A and Other Micronutrients: Biologic Interactions and Integrated Interventions," 8–11 March 1999, Durban, South Africa.

IVACG Scientific Consultations

- "WHO/UNICEF/IVACG Innocenti Conference in Micronutrients and Health: Emerging Issues Related to Supplementation," 17–20 April 2005, Florence, Italy.
- IVACG Workshop to conduct a comprehensive review of recommendations for the control of vitamin A deficiency developed over the last 20 years. 30 October – 3 November 2000, Annecy, France.

INACG International Symposia

- 2004 INACG Symposium "Iron Deficiency in Early Life: Challenges and Progress," 18 November 2004, Lima, Peru.
- 2003 INACG Symposium "Integrating Programs to Move Iron Deficiency and Anemia Control Forward," 6 February 2003, Marrakech, Morocco.
- 2001 INACG Symposium "Why Iron is Important and What to Do About It: A New Perspective," 15–16 February 2001, Hanoi, Vietnam.
- INACG Symposium, 12 March 1999, Durban, South Africa.

INACG Scientific Consultations and Programmatic Workshops

- Organized the INACG workshop "Reducing the Prevalence of Anemia: Planning and Implementing a Strategic Communication Approach," 16–17 September 2002, Cape Town, South Africa.
- Organized the INACG consultation "Iron-Deficiency Anemia: Reexamining the Nature and Magnitude of the Public Health Problem," 21–24 May 2000, Belmont, Maryland, USA.

Appendix C

IVACG, INACG, and MGL Publications

IVACG Publications

- Strategic Placement of IVACG in the Evolving Micronutrient Field (Revised 2004)
- IVACG Statement: The Annecy Accords to Assess and Control Vitamin A Deficiency (2003) available in English, French, Spanish, and Portuguese
- IVACG Statement on Maternal Night Blindness A New Indicator of Vitamin A Deficiency (2002)
- Conversion Factors For Vitamin A and Carotenoids (2002)
- Delivery of Vitamin A Supplements with DPT/Polio and Measles Immunizations (2000)
- Status of the Studies on Vitamin A and Human Immunodeficiency Virus Infection (2000)
- Combining Vitamin A Distribution with EPI Contacts (2000)
- The Bioavailability of Dietary Carotenoids: Current Concepts (1999)
- IVACG Statement on Vitamin A and Iron Interactions (1998)
- IVACG Statement on Safe Doses of Vitamin A During Pregnancy and Lactation (1998)
- IVACG Meeting Reports: 2003, 2001, 1999

INACG Publications

- Efficacy and Effectiveness of Interventions to Control Iron Deficiency and Iron Deficiency Anemia (2004)
- The Role of Communication in Comprehensive Anemia Control: A Framework for Planning and Implementing a Strategic Communication Plan (2003)
- Adjusting Hemoglobin Values in Program Surveys (2002)
- Technical Brief on Iron Compounds for Fortification of Staple Foods (2002)
- Anemia, Iron Deficiency, and Iron Deficiency Anemia (2002) available in English, French, Portuguese, and Spanish
- Safety of Iron Supplementation Programs in Malaria-Endemic Regions (1999)
- Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia (1998)
- The Effects of Iron Deficiency and Anemia on Mental and Motor Performance, Educational Achievement, and Behavior in Children - An Annotated Bibliography (1998)
- INACG Meeting Reports: 2003, 2001, 1999

MGL publications

- Appropriate uses of Vitamin A Tracer (Stable Isotope) Methodology (2004)
- A Procedure to Estimate the Accuracy and Reliability of HemoCue™ Measurements of Survey Workers (2003)
- Micronutrient Fact Sheets (2003)

- Quality Assurance as Applied to Micronutrient Fortification (2002)
- A Study of Factors Influencing Operational Issues for Iron Supplements for Infants and Young Children (2000)
- A Guide to Carotenoid Analysis in Foods (1999)

Appendix D

Targeted Operational Research Grants

Name	Institution	Grant Title	Agreement Dates	Total
Namanjeet Ahluwalia	The Pennsylvania State University	Evaluation of Iron Status of Children in Presence of Infection: Effects of Iron Supplementation on Iron Status, Infection and Morbidity	3/30/00 – 7/31/00	$100,000
Paul Arthur (deceased)	Kintampo Health Research Centre	A Randomized Double-blind Placebo Controlled Trial to Evaluate the Impact of Vitamin A Supplementation on Maternal Mortality in Ghana (ObaapaVitA Trial)	1/1/00 – 9/30/03	$1,489,571
John Beard	The Pennsylvania State University	Prevention of the Negative Behavioral Effects of Iron Deficiency in Mothers	9/1/99 – 12/30/00	$100,000

Anthony Costello	Institute of Child Health	Community Interventions to Improve Child Survival in Rural Nepal: A Cluster Randomized Controlled Trial of the Impact of Women's Groups on Neonatal Mortality, Stillbirths, and Maternal and Infant Nutrition	6/1/04 – 9/20/05	$250,000
Kathryn Dewey	University of California	Comparison of the Efficacy and Acceptability of Three Types of Micronutrient Supplements Added to Complementary Foods for Infants in Ghana	7/1/03 – 9/27/05	$18,597
Alizon Draper Andrew Hall	London School of Hygiene and Tropical Medicine	Inputs to Women Health Care Provider Projects	4/05–9/05	$100,000
Eric Gershwin	University of California, Davis	The Role of Nutritional Supplements on Adaptive Immune Responses in Kenya	12/1/99 – 2/28/01	$69,527
Eric Gershwin	University of California, Davis	The Role of Nutritional Supplementation Adaptive Immune Responses to Local Pathogens in Ghana	12/1/99 – 2/28/01	$69,527

Nihal Goonewardene/ Samuel Newton	MOST 2	The Role of Women Health Care Providers as "Change Agents" in Nutrition Interventions: Report of an Exploratory Study in the Eastern Region of Ghana	6/1/04 – 9/15/05	$176,906
Jessica Jitta	Makerere University	Improving Health and Nutrition of Community Women Health Providers to Enable Them to Be a More Effective Agent of Change	5/1/04 – 9/15/05	$230,000
Betty Kirkwood	London School of Hygiene and Tropical Medicine	Ghana, Vitamin A, and Maternal Mortality "ObaapaVitA" Trial: Development of Infant and Neonatal Work Program, Phase 1	6/1/05 – 9/15/05	$100,000
Ramesh Potdar	Centre for Study of Social Change	Mumbai Maternal Diet Study	11/1/04 – 9/1/05	$200,000
Laxmi Rahmathullah	Family Health & Development Research Services Fund	Self-sustaining Community-based Effort to Improve Child Nutrition in Tamilnadu, India	2/1/05 – 9/1/05	$15,000
Francisco Rosales	The Pennsylvania State University	Assessment and Determination of Biomarkers of Inflammation in Urine	2/1/05 – 9/1/05	$45,000

Harshi Sachdev	Maulana Azad Medical College	Meta Analysis of the Effect of Multiple Micronutrient Supplementation (including iron) on Hemoglobin Response in Children and Pregnant Women	2/1/05 – 9/15/05	$13,800
Suttilak Smitasiri	Mahidol University	Karen Food Supplementation Intervention	12/1/04 – 9/1/05	$50,000
Stanley Zlotkin	Hospital for Sick Children	Assessment of "Dried Filter Paper Serum-Spot Method" for Measurement of Soluble Transferrin Receptor (sTfR) to Assess Iron Status in a Field Study of Iron Deficiency Anemia in Infants in the Kintampo Region of Ghana	10/1/99 – 6/30/01	$132,274
Stanley Zlotkin	Hospital for Sick Children	The Use of Microencapsulated Iron and Vitamin A Supplements (Sprinkles) to Treat and Prevent Iron and Vitamin A Deficiency: Field Trial Proposal	10/1/99 – 6/30/01	(covered within the same grant as above)

Appendix E

Reporting Requirements for Micronutrient Global Leadership Grants

To capture all necessary information for judging the quality and usefulness of data generated through Micronutrient Global Leadership grants, please follow these instructions for preparing progress reports and final project reports.

The U.S. Agency for International Development (USAID) funds targeted operational research to gather new knowledge that will be useful in improving the delivery of micronutrients (especially vitamin A and iron) in developing countries. It is critical that the funded projects provide detailed information about how they collect and analyze data so that the real value of these data can be appropriately judged.

These reports will be read by external reviewers and USAID staff, who will not necessarily have a copy of the original proposal. So adequate documentation, particularly for the hypothesis and research methods, is very important.

Progress Reports

The primary purpose of the progress report is to provide information on how the project is progressing. Any changes from the original proposal should be completely documented. This includes changes in study design, sample size, and key personnel. Reason for the change should be stated.

Reports should be organized in the following sections:

1. Update on the project's progress and findings, if available
2. Comparison of work completed against the project's timetable
3. Documentation of changes from original proposal and the reasons for these changes, including modifications made at the suggestion of the project monitor
4. Outline of next steps

The schedule for progress reports is part of the grant agreement you signed. Interim payments of your grant will not be made unless acceptable ("sufficiently detailed and comprehensive reports", as stated in your grant agreement) progress reports are received. Please note that your agreement states that we may terminate your grant for "failure to deliver reports…"

Final Report

This is a critical document and should provide all necessary information to evaluate the study findings. The final report should be organized into the following sections:

1. Executive summary, in layman terms, stating the study objective, key results, and usefulness of these results to USAID and the public health community
2. Objectives/hypothesis that was tested
3. Study design and sampling scheme
4. Research methods including details for the selection of samples; laboratory procedures with quality control procedures, where appropriate; and statistical methods used
5. Results with data tables and figures
6. Interpretation of results in light of current literature and significance of project findings for USAID and the public health community
7. Deviations from original proposal with discussion of the impact these changes may have had, including those made at the suggestion of the project monitor
8. Conclusions and recommendations
9. References

The final report will be reviewed and, if necessary, revisions requested. The final payment for your grant will not be made until the final report has been reviewed and accepted.

Appendix F

Other MGL grants

Howarth Bouis	HarvestPlus Program	USAID Funding Support to HarvestPlus	2/1/05–9/20/05	$200,000
Nihal Goonewardene/ Vicky MacDonald	MOST 1	Implementation of Ghana Strategic Communication Plan for an Integrated Anemia Control Program	5/1/03–9/29/04	$35,553
Sultana Khanum	WHO	WHO Regional Consultations in Support of the Development of a Strategy for Promoting Optimal Fetal Growth and Development	7/15/04–12/31/05	$250,000
Sonya Rabeneck	SCN	USAID Funding Support to the Publishing of the 5th World Nutrition Situation and SCN News	5/1/01– 3/31/03	$75,000
UNICEF (US Fund)	UNICEF	Micronutrient Activities to Achieve Millennium Development Goals	5/1/05–9/1/05	$235,400
Fiona Watson	Nutrition Works	Nutrition in Development Field Publication and Network	4/1/05–9/20/05	$65,000
Andrew Hall	consultant	A Review of the State of Current Knowledge of Micronutrient Deficiency Diseases and the Prospects for Future Programs	5/10/04 – 8/30/04	$72,000
Andrew Hall	consultant	A Review of Nutrition and Feeding of Infants and Young Children in Developing Countries	9/12/05 – 9/20/05	$17,000

Appendix G

Papers on the Cooperative Agreement or Its Individual Parts

Ahluwalia N, de Slivia A, Atukorala S, Weaver V, Molls R. Ferritin Concentrations in Dried Serum Spots from Capillary and Venous Blood in Children in Sri Lanka: A Validation Study. Am J Clin Nutr. 2002; 75: 289–294.

Ahluwalia N, Lönnerdal B, Lorenz G, Allen L. Spot Ferritin Assay for Serum Samples Dried on Filter Paper. Am J Clin Nutr. 1998; 67: 88–92.

Baker D, Nestel P. The Child is Father to the Patient: Many Diseases of Maturity Have Their Origins at the Start of Life. The Economist. June 12, 2003.

Beard JL, Hendricks MK, Perez EM, Murray-Kolb LE, Berg A, Vernon-Feagans L, et al. Maternal Iron Deficiency Anemia Affects Postpartum Emotions and Cognition. J Nutr. 2005; 135: 267–272.

Cook J, Flowers C, Skikne B. An Assessment of Dried Blood-Spot Technology for Identifying Iron Deficiency. Blood. 1998; 92(5): 1807–1813.

de Silva A, Atukorala S, Weerasinghe I, Ahluwalia N. Iron Supplementation Improves Iron Status and Reduces Morbidity in Children With or Without Upper Respiratory Infections: A Randomized Controlled Study in Colombo, Sri Lanka. Am J Clin Nutr. 2003; 77: 234–241.

Furr H, Green M, Haskell M, Mokhtar N, Nestel P, Newton S, et al. Stable Isotope Dilution Techniques for Assessing Vitamin A Status and Bioefficacy of Provitamin A Carotenoids in Humans. Public Health Nutrition. 2004; 8(6), 596–607.

Lyons GH, Stangoulis JCR, Graham RD. Exploiting Micronutrient Interaction to Optimize Biofortification Programs: The Case for Inclusion of Selenium and Iodine in the *HarvestPlus* Program. Nutr Rev. 2004; (I) 247–252.

Nestel P, Briend A, de Benoist B, Decker E, Ferguson E, Fontaine O, et al. Complementary Food Supplements to Achieve Micronutrient Adequacy for Infants and Young Children. J Pediatr Gastroenterol Nutr. 2003; 36: 316–328.

Nestel P. Invited Commentary: Micronutrients and Infections: Report of a Multidisciplinary Workshop held at Southampton, UK, 4–6 October 1998. Public Hth Nutr. 1999; 2: 237–240.

Perez EM, Hendricks MK, Beard JL, Murray-Kolb LE, Berg A, Tomlinson M, et al. Mother-Infant Interactions and Infant Development Are Altered by Maternal Iron Deficiency Anemia. J Nutr. 2005; 135: 850–855.

Sachdev HPS, Gera T, Nestel P. Effect of Iron Supplementation on Mental and Motor Development in Children; Systematic Review of Randomized Controlled Trials. Public Health Nutrition. 2004; 8(2): 117–132.

Siekmann JH, Allen LH, Watnik MR, Nestel P, Neumann CG, Shoenfeld Y, et al. Titers of Antibody to Common Pathogens: Relation to Food-Based Interventions in Rural Kenyan Schoolchildren. Am J Clin Nutr. 2003; 77: 242–249.

Solomons NW. Micronutrients and Infection: Report of a Multidisciplinary Meeting in Southampton, United Kingdom, Cosponsored by the Wellcome Trust and USAID, October 1998. Nutrition. 2000; 16: 1093–2000.

Wines M. Hope for Hungry Children Arriving in a Foil Packet: A Peanut-Based Paste is Lauded in Africa. The New York Times. August 8, 2005; A7.

Zlotkin S, Antwi KY, Schauer C, Yeung G. Use of Microencapsulated Iron (II) Fumarate Sprinkles to Prevent Recurrence of Anemia in Infants and Young Children at High Risk. Bulletin of the World Health Organization. 2003; 81: 108–115.

Journal Supplements:

Nutrition as a Preventive Strategy against Adverse Pregnancy Outcomes. J Nutr. 2003; 133: 1589S–1764S.

25 Years of Progress in Controlling Vitamin A Deficiency: Looking to the Future. Proceedings of the XX International Vitamin A Consultative Group Meeting: J Nutr. 2002; 132: 2843S–2990S.

Iron Fortification: Where Are We in Terms if Iron Compounds? A PAHO/FNP/USAID Technical Consultation. Nutr Rev. 2002 Jul; 60(7) [II]: S50–S61.

Iron Deficiency Anemia: Reexamining the Nature and Magnitude of the Public Health Problem. J Nutr. 2001; 131: 563S–703S.

Iron and Maternal Mortality in the Developing World. Am J Clin Nutr. 2000; 72: 209S–314S.

Appendix H

Publications Survey Tool

Micronutrient Global Leadership Project Survey

Thank you for agreeing to take this survey. With your feedback, we aim to improve publications from the International Vitamin A Consultative Group (IVACG), the International Nutritional Anemia Consultative Group (INACG), and the Micronutrient Global Leadership (MGL) project to meet your information needs.

These projects, funded through the U.S. Agency for International Development, are devoted to reducing the prevalence of vitamin A and iron deficiencies worldwide.

The survey should only take 5-10 minutes to complete. Your survey responses will remain completely confidential and individual responses will not be shared with others. Therefore, we encourage you to respond as openly and honestly as possible.

Questions marked with an asterisk (*) must be answered.

*** 1. In which region do you primarily work? (More than one answer is possible.)**

- ❑ North America
- ❑ Middle East and North Africa
- ❑ Southern and Eastern Africa
- ❑ East Asia and the Pacific
- ❑ Central and Eastern Europe
- ❑ Latin America and the Caribbean
- ❑ Western and Central Africa
- ❑ South Asia
- ❑ Western Europe

*** 2. In which type of organization do you work? (Please pick one)**

- ❑ Government Agency
- ❑ UN Agency/Multilateral
- ❑ Private Company
- ❑ Research Institute
- ❑ Non-governmental Organization (NGO)
- ❑ Bilateral Agency
- ❑ University/Training Institute
- ❑ Other (please specify) _____

*** 3. What type of position do you hold? (Please pick one)**

- ❑ Policy maker
- ❑ Researcher
- ❑ Professor/Lecturer
- ❑ Student
- ❑ Project Manager
- ❑ Technical/Medical Officer
- ❑ Consultant
- ❑ Other (please specify) _____

*** 4. Have you ever read or used a publication from the International Vitamin A Consultative Group (IVACG), the International Nutritional Anemia Consultative Group (INACG), or the Micronutrient Global Leadership (MGL) project?**

❑ **Yes** ❑ **No (If no, skip to question #7)**

*** 4a. If yes, how satisfied were you overall with the following aspects of our publications? (Please pick one answer for each line)**

Clarity	❑ Excellent	❑ Good	❑ Fair	❑ Poor
Technical quality	❑ Excellent	❑ Good	❑ Fair	❑ Poor
Presentation	❑ Excellent	❑ Good	❑ Fair	❑ Poor
Length of publication	❑ Excellent	❑ Good	❑ Fair	❑ Poor
Cost	❑ Excellent	❑ Good	❑ Fair	❑ Poor
Access (how easy it was to obtain)	❑ Excellent	❑ Good	❑ Fair	❑ Poor

4b. Any other comments (Use examples of specific publications, if possible):

_____

_____

_____

*** 5. How did you obtain your MOST RECENT copy of an IVACG, INACG, or MGL publication? (Please pick one)**

❑ I ordered my own copy

❑ I downloaded it from the internet

❑ I borrowed a colleague's copy

❑ Other (please specify) _____

6. What was the title or topic of the most recent publication you used from IVACG, INACG, or MGL, and how did you use this publication?

6a. Publication title or topic:

_____

6b. What was your use for this publication:

_____

6c. How helpful was the publication in your above stated use for it? (Please pick one)

❑ Very helpful ❑ Helpful ❑ Somewhat helpful ❑ Not helpful at all

*** 7. Please rank the USUAL ways you hear about new publications (this includes ALL publications in your professional area, not only IVACG, INACG, or MGL publications):**
(Please pick one answer for each line)

	Very helpful	Helpful	Somewhat helpful	Not helpful
❑ Email announcement	❑	❑	❑	❑
❑ Website announcement	❑	❑	❑	❑
❑ Postcard announcement	❑	❑	❑	❑
❑ Complimentary Copy in the mail	❑	❑	❑	❑
❑ News release	❑	❑	❑	❑
❑ Colleague recommends it	❑	❑	❑	❑
❑ Newsletter announcement or review	❑	❑	❑	❑
❑ Meeting/conference materials or exhibit	❑	❑	❑	❑

7a. Are there other ways you like to be notified? _____

*** 8. How do you PREFER to obtain publications? (Please pick one)**

❑ Download a PDF from the internet ❑ Order a hard copy
❑ BOTH PDF and hard copy are equally useful ❑ Other (please specify) _____

*** 9. Currently, most of our publications are published in English. Would you like to see publications in other languages? ❑ Yes ❑ No (If no, skip to question #10)**

9a. If yes, which language(s) would be most useful to you? (More than one answer is possible.)

❑ French ❑ Spanish
❑ Portuguese ❑ Other (please specify) _____

10. What new topics would you like to see covered in our future publications?

_____

_____

11. Additional comments?

_____

_____

You are done!

Thank you for taking the time to complete this survey. If you have any questions regarding this survey, please contact us at: hni@ilsi.org.

PLEASE RETURN THIS SURVEY BY September 30, 2005 to hni@ilsi.org; OR BY MAIL to: IVACG/INACG Secretariat, International Life Sciences Institute, One Thomas Circle, NW, Ninth Floor, Washington, DC 20005, USA; OR BY FAX to: 1-202-659-3617.

Appendix I

Survey Findings

Appendix I1

Survey Q 4b. Any other comments (Use examples of specific publications, if possible):

Technial Quality/Suggestions:

All is good, but if it's possible, include publications made with cooperation of other institutions like UNICEF, OMS, UNU. Thanks.

All publication I receive from conferences. In trace elements, more detail was needed.

The information on iron deficiency status published in 'Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia' looked very authentic. However these guidelines are not strongly supported, and in fact, no clear guidelines exist to measure iron deficiency in populations and we struggle in measuring them even now. There are plenty of indicators but each one has serious limitations.

Some of the publications I read were good but most of them left a few unanswered questions.

Very specific to congress. It will be more interesting to publish any work related to area of interest.

1. Improve research coverage on the relation of vitamin A with vitamin C, zinc and iron in enhancing health and nutritional status of children. 2. Research on appropriate food-based approaches to combat vitamin A deficiency.

IVACG/INACG fairly discuss the deficiency problems in North Africa.

It is in more high tech. than community-oriented as in developing country is not easy to afford.

Length/Clarity:

Try to make some reading material simple for field workers who are the implemetors of policy. Many policy makers do not have to read lengthy materials in order to implement research findings so they remain on shelves. Thanks a lot.

I think a little more comprehensive, and at the same time focus is needed.

The articles are more abstracted and short.

Presentation:

It is difficult to read the abstracts of all papers due to the small font used.

Some of the documents were scans of the paper documents. In these document the clarity was poor.

Heavy on text; limited use of bullets, charts and tables to enhance readability.

Language:

Please, when possible, make the publications in Spanish too.

The Arabic publications are poor.

Access:

Your publications are not easy to obtain. I hope to obtain your publications such as 'A Guide to Carotenoid Analysis in Foods' free as your regular loyalist.

It will be more useful if we can receive publications in a regular manner.

Rarely I have seen.

Mailing slows the receipt.

I do not have the titles of the books; they are at the University and it is closed for vacation.

Make people know about publications of latest info maybe by maintaining a list of addresses of universities, research organizations, and other bodies. Add more illustrations.

Postage time needs to be improved. Every reader want fresh and updated information in good time. These days I don't know whether I have been deleted but I don't get copies these days. My current address is P.O. Box TL 2032, Tamale-N/R, Ghana.

Those publications have been donated by NGOs.

The publication list should be updated more frequently and the most important publications to refer to highlighted in some way. The policy statements are very important, e.g., vitamin A.

I have had a little problem to get some publications like '1993 Brief Guide to Current Methods of Assessing Vitamin A Status' because it is not available on PDF format. So I decided to request, but I did not receive anything yet. So I think that all the documents, including the old ones, should be in PDF format.

Most of the publications are excellent and used by us extensively but the accessibility is very limited and sometimes we are not aware about the publications.

I want to receive the new version by mail.

The IVACG etc publications are sent to those who attend the meetings. Otherwise the access is online. Some may have difficulty if they fulfill neither criteria, i.e. did not attend and does not have internet access.

Sometimes I cannot access the publications.

Except for meeting papers, we could not see other materials of IVACG. We hope to know the regular journals of IVACG.

Positive Feedback:

Publication on night blindness was the best.

I view IVACG publications as authoritative, I would not be without them.

Your publications and symposia and workshops are quite appropriate and useful.

Your publications are an excellent help.

It has served to me to know strategies that comes applying to other countries to be able to fight the deficiency of these micronutrients (iron and vitamin A).

I had good reference materials for planning on anemia supplementation program for pregnant women and when designing an intervention trial using micronutrient fortified beverage.

Good technical and research updates and current issues in policies and programs.

The publications are in general very good and provide the latest information.

Reports from the IVACG meetings in Morocco and Peru. These were well covered and very informative.

Most of the time I am sent copies on CD/post whenever I ask for them.

The publications are part of the bibliography that I use for the elaboration of projects with objectives in health and nutrition for childhood and families.

The content in particular met my research needs at the time e.g., publication on Iron Deficiency Anemia and Adjustment of Hb levels (I don't have actual title at the moment).

Overall are good to read and well understood.

Appreciate your prompt response when I request free copies of publications.

The information was very vital since we are implementing micronutrient and health programs.

Good

These publications are always very reader-friendly and easy to download.

All very useful and easy-to-read. Have recommended to many people and used as refs for my own publications.

Information was useful to clarify some technical issues regarding challenges on vitamin A supplementation.

Interesting reading.

It is informative.

I like.

Satisfactory is the word.

The publications are excellent. During the conference in Lima I had the opportunity to obtain various publications and they are helping me very much in my work.

Cost:

There should be a column of N/A (not applicable) in question 4a. The question on cost is not applicable for me because I do not know how much a publication costs since I am not buying any of the publications.

Cost is not applicable as I visit the library at NIN.

I got the publication free, so there was no cost implication.

Regarding cost, I would tell that I receive the publications free of charge, due to my residence in a developing country; so it would be 'excellent.'

All the IVACG/INACG publications that we have with us were sent to us by ILSI free of charge. We are very grateful for that. We use these publications for research and teaching purposes.

I have always received the publications free when ever requested. The quality as well as quantity of the work presented is sufficient.

I answered the question provided for cost because it is not possible to go to the next page. I have not yet bought a publication.

When I read your publications, I was still working with a government institution in Asia. We were not asked to pay for the publications.

It is important to have all the publications is free of charge especially for NGO institution reference purposes.

I would not really pay for this as it is outside my immediate area of concern.

Miscelleneous or N/A:

Please include a suggested citation on all future publications. This would make it much easier to correctly cite the document. Some documents have not included all of the information in a standard citation (author, publisher, city of publication, date, etc).

Conference proceedings IVACG, INACG, MGL.

Vit. A mortality and morbidity studies The control of xerophthalmia.

Acces, cost, and translation.

Vitamin A supplementation during pregnancy. The use of Iron EDTA to combat anemia.

The questions in 4a are very general and difficult to answer. I don't feel comfortable with my 'good' answers but I don't know what else to answer, and I miss a 'don't know' alternative.

I attended the meeting in Morocco -- that's when I read a copy.

Report on IVACG/IVACG conferences.

I would like to be the focal point for the group from Cameroon.

I like 'SIGHT AND LIFE,' 'SIGHT AND LIFE Manual on Vitamin A Deficiency Disorders (VADD),' Second Edition 2001, Donald S. McLaren and Martin Frigg. 'Vitamin A Deficiency and Its Consequences: A Field Guide to Detection and Control,' Third Edition, Alfred Sommer.

I think the SIGHT AND LIFE magazine should be in both language English and Spanish.

I'd read the paper 'Food matrix effects on carotenoid absorption' published in Newsletter 3/2004, and I enjoyed it. I'm so interesting in that topic, I live at Peru, a country where animal foods aren't so available, but we have so many plants. One of the best things of that Newsletter are the photographs. Thanks for the information, Margot.

SIGHT AND LIFE is sent to me by Dr. Frigg but for any other, we have to search the internet.

Survey Q 6a. Publication title or topic:	Use category*	Survey Q 6b. What was your use for this publication?:	Survey Q 6c. How helpful was the publication in your above stated use for it?			
XIX IVACG Meeting Report - South Africa	Res	Research			Somewhat helpful	
XIX IVACG Meeting Report - South Africa	Res	Research of vitamin A and minerals e.g., iron, copper	Very helpful			
XXI IVACG Meeting abstracts - Morocco	Res	For developing a research proposal and for students		Helpful		
XXI IVACG Meeting Report - Morocco	K	A variety of information on the dietary method of vitamin A supplementation; kitchen gardening; unconventional sources of beta-carotene such as orange-fleshed sweet potato, red palm oil, etc.	Very helpful			
XXI IVACG Meeting Report - Morocco	K	To learn from the recent progress in vitamin A and carotenoids		Helpful		
XXI IVACG Meeting Report - Morocco	Ref	Looking for an abstract from West African country	Very helpful			
XXI IVACG Meeting Report - Morocco	Ref	Looking up current vitamin A recommendations	Very helpful			
XXI IVACG Meeting Report - Morocco	Ref	Quoted in a paper	Very helpful			
XXI IVACG Meeting Report - Morocco	Ref	Reference		Helpful		
XXI IVACG Meeting Report - Morocco	Res	To make research for a course and to read further		Helpful		
XXI IVACG Meeting Report - Morocco	T	Source of information for lectures			Somewhat helpful	
XXI IVACG Meeting Report - Morocco	W	In reviewing vitamin A supplementation program strategies	Very helpful			
XXI IVACG Report - Morocco	Ref	Reference		Helpful		
XXII IVACG Meeting abstracts - Peru	K	Acquire current knowledge		Helpful		

XXII IVACG Meeting abstracts - Peru	K	Background		Helpful		
XXII IVACG Meeting abstracts - Peru	K	Source of scientific info	Very helpful			
XXII IVACG Meeting abstracts - Peru	Ref	Bibliography	Very helpful			
XXII IVACG Meeting abstracts - Peru	Res	To gather basic information about retinol 10 000 UI		Helpful		
XXII IVACG Meeting abstracts - Peru	Res	Research findings	Very helpful			
XXII IVACG Meeting presentation - Peru	K	Info on cost of fortification	Very helpful			
2003 INACG Symposium Report - Morocco	T	Personal training		Helpful		
2003 INACG Symposium Report - Morroco	Ref	Fact checking	Very helpful			
IVACG/INACG - Morocco	K	Reading all the abstracts	Very helpful			
IVACG/INACG - Morocco	T	Nutrition education		Helpful		
2004 INACG Symposium abstracts - Peru	Ref	References		Helpful		
2004 INACG Symposium abstracts - Peru	T	Teach students		Helpful		
IVACG/INACG - Peru	P	Read and passed on to government counterparts	Very helpful			
IVACG/INACG - Peru	Ref	Reference for my thesis work	Very helpful			
IVACG abstracts	Ref	Literature reviews			Somewhat helpful	
IVACG abstracts	Res	Research purposes	Very			

			helpful			
IVACG Meeting Report	K	To know about the recent trends in vitamin A research		Helpful		
IVACG Meeting Report	Ref	Looking for abstract	Very helpful			
IVACG Meeting Report	Ref	Recapping on pertinent issues raised at the meeting	Very helpful			
INACG Symposium abstracts	W	To find something that will help me in reducing IDA in M.P. India		Helpful		
IVACG/INACG Conference proceedings	K	Reading		Helpful		
Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia	P	Check policy information	Very helpful			
Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia	Ref	Reference	Very helpful			
Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia	Ref	Reference	Very helpful			
Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia	Ref	To prepare a background/literature review	Very helpful			

Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia	T	For teaching, training		Helpful		
Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia	W	To design and implement iron supplementation programs	Very helpful			
Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia	W	To find current recommendations on iron dosages and parasitic treatments	Very helpful			
Guidelines for the Use of Iron Supplements to Prevent and Treat Iron Deficiency Anemia	W	Use to get cut-off points for national anemia survey	Very helpful			
The Annecy Accords to Assess and Control Vitamin A Deficiency	K	Adjusted definitions		Helpful		
The Annecy Accords to Assess and Control Vitamin A Deficiency	Ref	For discussion on vitamin A deficiency in a research article	Very helpful			
The Annecy Accords to Assess and Control Vitamin A Deficiency	Ref	For reference on recommendation on Vitamin A supplementation	Very helpful			

The Annecy Accords to Assess and Control Vitamin A Deficiency	Ref	Reference citation for recommendations about vitamin A supplementation		Helpful		
The Annecy Accords to Assess and Control Vitamin A Deficiency	W	New criteria to determine the extent and severity in a population; Schedule for routine high-dose VA supplementation	Very helpful			
The Annecy Accords to Assess and Control Vitamin A Deficiency	W	Recommendations	Very helpful			
Efficacy/Effectiveness	K	General reading		Helpful		
Efficacy/Effectiveness	Ref	Reference doc	Very helpful			
Efficacy/Effectiveness	Ref	Reference for a talk		Helpful		
Efficacy/Effectiveness	W	Program evaluation	Very helpful			
Efficacy/Effectiveness	W	Review the national iron supplementation program in the Ministry of Health	Very helpful			
The Role of Communication in Comprehensive Anemia Control	T	Assist my staff in developing communication strategy			Somewhat helpful	
The Role of Communication in Comprehensive Anemia Control	T	For teaching university students	Very helpful			
The Role of Communication in Comprehensive Anemia Control	W	Preparation for a workshop		Helpful		

The Role of Communication in Comprehensive Anemia Control	W	To practice in my work with the children	Very helpful			
A Guide to Carotenoid Analysis in Foods	Ref	For reference in corporate library		Helpful		
A Guide to Carotenoid Analysis in Foods	Ref	Reference, newsletter, methodology	Very helpful			
about communication	K	To read		Helpful		
Adjusting Hemoglobin Values in Program Surveys	Res	Formulate testing protocol	Very helpful			
all publications are excellant	K	Improve my knowledge	Very helpful			
all this	Ref	To write the doctoral thesis		Helpful		
anaemia, preventive measures	Res	Research		Helpful		
anemia	K	Learning other experiences			Somewhat helpful	
anemia	Res/T	Used it for own research as well as for teaching	Very helpful			
anemia	Ref	Reference for a supplementation pilot study to implement an anemia control intervention in the national program 'wawa wasi' (baby house) in Peru.	Very helpful			
anemia	Res/T	Research and teaching	Very helpful			
anemia	T/Res	Teaching and research		Helpful		
anemia	W	Basis for health and nutrition interventions	Very helpful			

Anemia, Deficiencia de Hierro, y Anemia Ferropriva (Anemia, ID, IDA)	Ref/T	Reference material and use for teaching health personnel	Very helpful			
anemia, iron status	Res	Research for graduate students		Helpful		
Appropiate uses of Vitamin A Tracer (Stable Isotope) Methodology	W	Share with staff		Helpful		
Appropriate Uses of Vitamin A Tracer (Stable Isotope) Methodology	Ref	As a resource	Very helpful			
article published in congress about vitamin A and zinc	T	I am a professor of higher education (masters and doctorate)	Very helpful			
assessment of vitamin A, iron status; proceedings of IVACG, INACG or MGL	T	Apply in our assessment, research and training	Very helpful			
assessment of zinc deficiency	W	To decide upon cut-off for serum zinc value		Helpful		
Biochemical Methodology for the Assessment of Vitamin A Status	Res	Research methods	Very helpful			
carotenoids from fruits	W	Technology and analysis		Helpful		
clinical signs of vitamin A deficiency disorders	T	Lecture at the medical school		Helpful		

communication program for promoting increased awareness about plant sources of vitamin A	T	I had used it for teaching at university		Helpful		
consumption of vitamin A	Ref	As reference for my work			Somewhat helpful	
contribution of mathematical modeling to understanding whole-body vitamin A metabolism and to the assessment of vitamin A status	Res	Apply to my research, knowledge		Helpful		
controlling VAD	T	Preparation for revision lecture for West African College of Physicians		Helpful		
Conversion Factors for Vitamin A and Carotenoids	T/Res	Teaching and research	Very helpful			
cost effectiveness of iron supplementation	W	Obtained information on cost-benefit analysis		Helpful		
Deficiencia de Hierro en la Infancia y la Nin~ez (Iron Deficiency in Infancy and Childhood)	W	In order to sensitize the health personnel in the problem of iron deficiency	Very helpful			
Deficiencia de Hierro en Mujeres (Iron Deficiency in Women)	T	For teaching students		Helpful		
Delivery of Vitamin A Supplements with DPT/Polio and Measles Immunizations	Ref	Reference		Helpful		

destruction of vitamin A	Ref	Review			Somewhat helpful	
effect of iron supplementation on hematologic parameters	Ref	Bibliographic work		Helpful		
efficacy of intermittent iron supplementation	Ref	Consultation	Very helpful			
feeding nonbreastfed children from 6-24 months	Res	Research purposes		Helpful		
'Focusing on Anaemia: Towards an Integrated Approach for Effective Anaemia Control' (2004), WHO, UNICEF	T	Community talk			Somewhat helpful	
'Focusing on Anaemia: Towards an Integrated Approach for Effective Anaemia Control' (2004), WHO, UNICEF	W	Multinutrient-based strategies to fight anemia			Somewhat helpful	
food fortification	W	Our experience		Helpful		
food matrix effects on carotenoid absorption	T	I use it in preparing a class about carotenoid bioavailability for my students	Very helpful			
I don't know the title exactly but I used the publications related to the micronutrient (selenium)	Res	In my research		Helpful		
I don't remember	K	I am interested in vitamin A, iron, lysine			Somewhat helpful	
I don't remember	K	I read it personally		Helpful		
I don't remember	K	Increase my knowledge	Very helpful			

I don't remember	K	Information		Helpful		
I don't remember	Ref	As a reference		Helpful		
I don't remember	Res	Research/information	Very helpful			
I don't remember	W	For my consulting business			Somewhat helpful	
I have a good number, I cannot remember all now	Res	Research literature		Helpful		
I used to get the meeting reports	T	I used them to keep up more with the literature when I was research advisor to graduate students doing research on iron and vitamin A		Helpful		
I usually read the IVACGpublications because I work with vitamins and carotenes analysis	Ref	When necessary I use these publication as references in my papers.		Helpful		
IDA assessment prevention and control	W	Get supplementation doses and cut-off points to determine anemia	Very helpful			
INACG	Res/Ref	research/references	Very helpful			
INACG technical report	T	Disseminate among university colleagues	Very helpful			
Innocenti Micronutrient Research Report #1	K	For information purposes		Helpful		
Innocenti Micronutrient Research Report #1	T	Review as a participant, to prepare a seminar	Very helpful			
Innocenti Micronutrient Research Report #1	T	Teaching	Very helpful			
intervention trials for anaemia in pregnancy	Res	Research on efficacy of a micronutrient-fortified beverage in pregnancy	Very helpful			

iron	W	Was working on a nutrition project		Helpful		
Iron	W	Work		Helpful		
iron and development	W	Project		Helpful		
Iron and Vitamin A	Ref	Reference	Very helpful			
iron deficiency	Res/T	Research and teaching	Very helpful			
Iron Deficiency Anaemia: Assessment, Prevention, and Control. A guide for programme managers	Ref	Redaction of my PhD manuscript	Very helpful			
iron deficiency anemia	Res/W	Guidelines for my country's research and intervention	Very helpful			
iron deficiency anemia	T	Teaching purposes	Very helpful			
Iron deficiency anemia	T	Training and lecture and workshop	Very helpful			
Iron Deficiency in Infancy and Childhood	K	Seminar presentation and the publication	Very helpful			
Iron Deficiency in Infancy and Childhood	Ref	For writing paper		Helpful		
Iron EDTA for Food Fortification	Ref	Reference material	Very helpful			
Iron EDTA for Food Fortification	Ref	Resource	Very helpful			
iron fortification	K	Information		Helpful		
iron fortification	Res	International studies		Helpful		
iron fortification	T	Training & educational purposes	Very helpful			
iron suplementation	K	Information		Helpful		

iron suplementation	Ref	My thesis		Helpful		
Iron supplementation: comparison of daily and weekly iron supplementation. Paper presented in the International Nutritional Anemia Consultative Group (INACG) symposium: Why iron is important and what	Res	Research	Very helpful			
iron, zinc, vit A supplmenetation in infants; Effect of vit A and zinc on immune response in Indonesia	T	Lecture	Very helpful			
Its a long time now	Ref/T	Reference material and lecturing material	Very helpful			
IVACG	K	Informative		Helpful		
IVACG	K	Knowledge			Somewhat helpful	
IVACG report	K	Info		Helpful		
IVACG Statement on Vitamin A and Iron Interactions	T	It was one of my first reads for preparing a presentation in a course about micronutrients.		Helpful		
Magnitude of anaemia	Res	Our research is being carried out mainly on micronutrient deficiencies		Helpful		
many titles	T	Reading, teaching	Very helpful			
Maternal Night Blindness: A New Indicator of Vitamin A Deficiency	K	Informational	Very helpful			

Maternal Night Blindness: A New Indicator of Vitamin A Deficiency	Ref	File for future use				Not helpful at all
Maternal Night Blindness: A New Indicator of Vitamin A Deficiency	W	Technical assistance		Helpful		
meeting report	K	Update on scientific issues	Very helpful			
MGL Fact sheets	Ref	To include on a CD	Very helpful			
MI articles on micronutrient issues	K	My area of interest	Very helpful			
micronutrients	Res	Research	Very helpful			
micronutrients and vitamin a	K	Micronutrients		Helpful		
more than one	T	Teaching		Helpful		
nutrition, anemia	W	Milk fortification of iron			Somewhat helpful	
prevalence vitamin A deficiency	K	Information		Helpful		
Provitamin A Content in Golden Rice	K	Information	Very helpful			
Recommeded levels of vit A supplementation	Ref	Quick resource on supplementation levels	Very helpful			
Report	Ref	Documentary revision		Helpful		
report on zinc	W	To prepare the survey in Morocco	Very helpful			
role of micronutrients etc, improving vit a status	Ref/T	Report write up and proposal development. Generally I use most of the publications in health education.	Very helpful			

Safe Dosis of Vitamin A During Pregnancy and Lactation	W	Fortified product dossier		Helpful		
Safety of Iron Supplementation Programs in Malaria-Endemic Regions	Res	Research		Helpful		
Safety of Iron Supplementation Programs in Malaria-Endemic Regions	Res	Student		Helpful		
SAL	Ref	Information/references	Very helpful			
SAL	T	Preparation of lecture		Helpful		
SAL	T/Res	Teaching & research		Helpful		
SAL	W	The methodology used for computing vitamin A deficiency especially the fortification by the natural sources	Very helpful			
SAL - A digest of recent literature by Donald S McLaren	Ref	Literature review	Very helpful			
SAL - Manual on Vit A Deficiency Disorders	T/Res	For lecture and research	Very helpful			
SAL - Manual on Vit A Deficiency Disorders	W	We are proposing including vitamin A testing in our clinics			Somewhat helpful	
SAL (lutein and zeaxanthin in vision	Res/T	Research and education purposes	Very helpful			
several	Res	Research		Helpful		
several publications on iron	Res	Background in preparation for research			Somewhat helpful	

simplified dietary assessment of vitamin A intake	W	Field survey at the rural to assess dietary vitamin A intake among preschool children. The work has been published.	Very helpful			
so many	Ref	Reference and documentation	Very helpful			
Strategic Placement of IVACG in the Evolving Micronutrient Field	K	To get information for my personal development		Helpful		
Strategic Placement of IVACG in the Evolving Micronutrient Field	K/A	Personal reading and advocacy	Very helpful			
Sugar fortification manual 1-3	T	In university education		Helpful		
synergistic effects of iron, vit. A, etc	Ref	As reference		Helpful		
The Bioavailability of Dietary Carotenoids	K	Assess most recent viewpoint of IVACG	Very helpful			
The Bioavailability of Dietary Carotenoids	K	Bioefficacy of b-carotene	Very helpful			
Vit A newsletter	K	Keep up to date on current research endeavors		Helpful		
vitamin A	Ref	Reference material	Very helpful			
vitamin A and anemia	T	Lecture materials	Very helpful			
vitamin A and child morbidity	K	Enrich knowledge			Somewhat helpful	
vitamin A and iron	Res	For my research purposes	Very helpful			
vitamin A and iron	T	Teaching	Very helpful			
vitamin A and iron publications	P	Background information for policy direction on micronutrient deficiency control in Nigeria	Very helpful			

vitamin A and iron topic	Ref	To right my submitted article for founded		Helpful		
vitamin A and other micronutrients	Res	I use them for research		Helpful		
vitamin A conversion factors	Ref	Article	Very helpful			
vitamin A def, control of IDD, iron def	T	Teaching medical student and training of field workers in community health	Very helpful			
vitamin A deficiency	K	General health information	Very helpful			
vitamin A deficiency	Ref	As a bibliographical source		Helpful		
vitamin A deficiency	Ref	Literature review		Helpful		
vitamin A deficiency	Res	Research			Somewhat helpful	
vitamin A deficiency	T	For classroom teaching		Helpful		
vitamin A deficiency	T	Teaching		Helpful		
vitamin A deficiency	W	Daily work		Helpful		
vitamin A deficiency	W	To supplement existing information on vitamin A supplementation program	Very helpful			
vitamin A deficiency	W	Vitamin A is now mandatory and we monitor the standards for possible prosecution		Helpful		
Vitamin A deficiency and Its Vonsecuences	Res	Research		Helpful		
vitamin A in africa and indonasia	W	To apply to Indian conditions	Very helpful			
vitamin A metabolism	Ref	References		Helpful		
vitamin A newsletter	K	Information		Helpful		
vitamin A requeriments	Res	To make a project from investigation		Helpful		
vitamin A supplementation	W	Improving services		Helpful		
vitamin A supplementation	W	Make to new proposal		Helpful		

vitamin and mineral deficiency	Ref	As a bibliography in a qualitative research		Helpful		
vitamin A-rich food	T	At the university level, as a lecturer	Very helpful			

Appendix I3

Survey Q 10. What new topics would you like to see covered in our future publications?

Advocacy:

1. Evaluation of advocacy efforts in program situations. 2. Cost effectiveness of programs at different levels --the state and province levels--blocks and community. 3. Lessons learned which can be adapted for ensuring sustainability of the pilot projects.

Assessment:

Progress of retinoic acid receptor

Vitamin A deficiency, vitamin A conversion factors depended on matrix, processing, individual health status measuring methods including intrinsic labeling and extrinsic labeling with stable isotopes analysis methods of carotenoids in blood and feces.

Many are involved in research, and simpler field methods are being developed. Linking the users to the developers with cost-cutting benefits would be useful. Example: it is difficult to maintain the HPLC in many of our environment, yet if the analysis of for example retinol from a drop of whole blood is perfected and usable, it will be an advance.

Case studies, more local research, vital stats on intakes (trended by year)

MN assessment methods for VAD, iron, iodine, other MN. Summaries of USAID-funded research that advances our knowledge of what works for combating MN deficiencies.

Detailed information on the methodology to be used for each of the topics like you did for vitamin A a long time ago. I will like to replicate your questionnaire and see the workability.

Basic science on vitamin A:

Basic science related to vitamin A

Biotechnology:

Biotechnology and bioethics

Communications and Behavior Change:

About communication and applications in this area

Studies on the interest of the communication for the change of behavior in the control of the deficits in micronutrients (vitamin A, iron and iodine).

Nutrition behavior change, community participation

Child Development:

Iron deficiency and learning among children. Bioavailability of nonhaem iron in exclusive breastfeeding. Iron Deficiency and menopausal women.

Functional significance of Iron and vitamin A deficiency

I would like to know the relation between vitamin A deficiency and child growth, cognitive power. Also the importance of cooking in improving vitamin A precursor availability. It is very important to know the equation of the calolation of the RE equivalence of all carotenes. The iron natural enhancer and the effect of meal preparation on its activity.

Mental and cognitive development. Evaluation of control programs.

IDA in pregnancy and in children under two years of age. Projects related to early infancy, early stimulation, and prenatal. Nutrition and development. Vitamin A deficiency in infants. Fatty acids in early infancy, and in pregnancy.

Chronic Disease:

Micronutrients and chronic diseases

Micronutrients and chronic degenerating diseases

Topics: better nutrition, obesity

Detailed vitamin A supplementation/consumption as related to prevention of non-communicable disease such as skin cancer, cardiovascular diseases and others

Obesity, gestational diabetes and hypertension

Nutritional anemia, nutrition and non-communicable diseases.

Vitamin A as antioxidant for anticancer agent

Obesity

I would like to read about obesity, and antioxidants.

Community Approaches:

Methods to empower the community in controlling micronutrient problems

More field-oriented community-based intervention studies

Community-based issues in household food availability

Nutrition in adolescents, men, women, and young women. Community participation to improve nutrition-related behaviors. Agriculture and promotoin of crops.

Community ophthalmology through door-to-door screening methodology

Cost analyses:

Nutrition education, food economics

Pitfalls in ongoing programs, economic evaluation

Economic impact of vitamin A deficiency. Safety of vitamin A. The importance of other micronutrients in iron deficiency anemia.

Efficacy and Effectiveness:

Review of effectiveness of programs, NOT efficacy, but real life at country level

Efficacy and effectiveness of food-based approaches to combat micronutrient deficiencies

Effectiveness of vitamin A supplementation: a global program review. Zinc, iron, iodine and vitamin A interactions of public health significance. The benefits of maternal supplementation with VA: a dyad perspective.

Effectiveness of programs. Rapid screening methods for micronutrients.

Food general, Carotenoids, Bioavailability:

Carotenoids, vitamin A, iron

Destruction of vitamin A due to food processing

Food-based approaches

Bioefficacy of micronutrients

Most likely food types to increase vitamin A status (efficacy).

1.The bioavailability of carotenoids, especially from plants. 2. the impact of eating plants foods (esp. GLVs) rich in vitamin A in the control of anemia (as they are rich in polyphenols which inhibit iron absorption).

Recommendations to improce the absorption of vitamin and mineral supplements. Recommendations relative to the addition of vitamin and mineral to supplement products to improve their acceptability and presentation.

Exotic sources of vitamin A; vitamin A assessment methodology

application of plant extracts in correcting anemia

Special issue on locally available unconventional sources of beta-carotene-rich foods for each of the regions where vitamin A Deficiency is a public health problem. Special issue on genetically engineered vitamin A-rich foods. Nutrient fortification sprinkler.

Food-based strategies for improving micronutrient deficiencies. Use of isotope methods in evaluating nutrition intervention programs.

Topic related to food allergy

More food-based research findings compared with supplementation trials

Carotenoids in human health

Bioavailability models for determining provitamin A carotenoids in plant foods.

About carotenoids biodisponibility and benefit against mycotoxins effects

Functional properties of the referred nutrients (in opposition to their widely recognized nutrition functions).

Nanofoods and nutraceuticals for combating vitamin A deficiency, anemia, and other micronutrient deficiencies

The novel concept of biofortification, especially the use of genetic engineering technology to advance biofortification.

Bioavailability of provitamin A carotenoids in vegetables. Food fortification is an effective public health intervention.

Iron level in breastmilk and the impact

Methodology of micronutrient analysis in cereal crops

Food composition

The use of food supplements

Advantages/dangers of genetic engineering of foods with addition of micronutrients

Food Fortification:

Impact of fortification

Lysine fortification of wheat. Zinc fortification. Iodine.

Zinc supplementation, Edible oil fortification, double salt fortification

Databases on micronutrient deficiencies prevalence in Africa. Micronutrient fortification strategies to be used alleviate iron and zinc deficiencies in women living in African rural area.

Fortification of foods with iron, including efficacy of different fortificants and effectiveness of fortification programs

Food fortification assessment; Follow-up and program evaluation

Results of Fe fortification studies and recommendations

Fortification: benefit and limitations

Fortification challenges

Food fortification with vitamin A and iron

Advantages and disadvantages of fortification. Consequences of using a mix of strategies against micronutrient deficiency. Imbalances of micronutrients when one of them is fortified. More about carotenoid bioavailability.

Technological innovations, government policies about food fortification

Sugar fortification with iron

Fortification -- successes and failures to date? Vitamin A supplementation -- what to do after NIDs?

Double fortified salt use at public level. Effective and evidence-based options for iron feficiency control.

Funding Opportunities:

Research funding opportunities

Product development, nutrigenomic, funding

Food fortification info for NGOs in the area to receive project funds

Announcements of donors who are prepared to fund the fight against micronutrient malnutrition. Some learning experiences on the ground, e.g., constraints and successes being encountered by implementers of projects to combat micronutrient malnutrition in developing parts of the world.

Iron Deficiency/Anemia:

Absorption of iron, metabolism, ways to increase compliance, communication, approaches to reduce IDA

The problems of ferropenica anemia in populations of extreme poverty, and their incidence in infectious diseases mainly in children and women in fertile age.

Overcome iron deficiency disease. New developments in vitamin A research.

New strategies for micronutrient supplementation esp. iron

Intermittent iron supplementation

Iron deficiency and depression

Sickle cell anemia

New strategies to anemia control

Infectious Diseases:

The relationship between micronutrients and HIV and AIDS. There is a lot of research and are a lot of publications on this topic, but a statement would be very helpful

Micronutrient requirements for people living with AIDS. Micronutrients and malaria. Iodine status of pregnant and lactating women in developing countries.

Micronutrients, infections fortification

More information on HIV and AIDS and iron and zinc supplementation

Risks factors for anemia, immunity and anemia, fortification of foods, anemia in infants

Updated technical report on iron and infections

Immunological response in micronutrient deficiencies

More topics of relationships between vitamin A and the tropical human diseases

Micronutrient nutrition of people living with HIV/AIDS

Relation between nutrition and anemia, nutrition and parasitism, parasitism vs. anemia.

Influence of helminthic infections; role of breastfeeding

Articles describing/investigating the role of infection in the etiology of both vitamin A and iron deficiency states

Vitamin A and HIV, malnutrition and vitamin A coverage, vitamin A and routine immunizations

Infection and nutrition (vitamin A, anemia)

Relationships of vitamin A and diseases such as HIV, malaria, etc.

The interaction of iron requirements or iron supplementation with susceptibility to infection

Iodine:

Iodine, new micronutrient in oxidative stress involving

Control of IDD and iron deficiency anemia

1. Strategies successful in relation to the problem of anemia at the community level. 2. How to reduce anemia in adolescents and pregnant women.

Iodine content in algae porphyra. Interactions in non-heme iron absorption. Destruction of vitamin A in the processing of foods.

The role of vitamin A in IDD. Iron deficiency anemia in school in schoolchildren. Documentation of best practices on iron supplementation. Thyroid volume among schoolchildren.

Iodine deficiency, nutrition education for micronutrient intakes, zinc deficiency

Malnutrition general/Food Security:

Malnutrition in so-called modern civilizations; malnutrition in spite of numerous varieties of food.

I think we have not totally completed or covered the malnutrition topic. So we'd better go on with it.

Public nutrition

More topics about nutrition

Topics related to food security issues

1. Food security; 2. Local food approaches against VAD.

Micronutrients general:

Micronutrients

Nutrient deficiencies

Research on micronutrients

The role of micronutrients with regard to sports performance

Miscellaneous:

Joint IVACG (INACG...) with WHO in publication some important areas of technical aspect of vitamin A, iron, micronutrient is needed.

Environmental sanitation and hygiene practices

Herbal medicines as they can be used to control nutritional deficiencies and metabolic disturbances

Vitamin A is enough; but it should be in detail

Qualitative research about vitamin A

The original papers that will be presented in the future meetings, not only the abstracts.

The relation of nutritional status of infants to the respiratory system health. Especially after the pollution caused in the gulf region after the war in Iraq.

I would like to see you as ' vitamins and gene expression,' 'vitamins and cell signal transduction,' 'genetic engineering and vitamin improvement in foods, and so on covered in your future publications.

Happy with ANY information

It's ok

The scope and contents of your publications are excellent. I really have no suggestions.

Multiple Micronutrients/Micronutrients other than vitamin A, iron:

Mostly on iron deficiency, anemia, and other micronutrients apart from vitamin A

Iron folate and iodine deficiency

Multivitamin deficiencies problems, protein allergies, osteoporosis

Micronutrient interaction

It should concentrat all types of micronutrients and should consider general malnutrition

Anemia, vitamin A, zinc

Zinc and selenium importance in some disease conditions. Statistical methods of measuring micronutrient impacts.

Folic acid, vitamin B12 and vitamin D

Micronutrient interactions

Multiple micronutrients: efficacy, health impact, micronutrient interactions

Relative al zinc, vitamin C, and copper

Zinc and folate deficiencies

Folic acid and B-complex

Vitamin K

Little more focus on the micronutrients other than iron and vitamin A

Other micronutrients

Vitamin D and E

Zn, Se

Other micronutrient topics besides vitamin A, iron, zinc

Other micronutrients deficiencies

Policy:

Policy of micronutrient control and prevention at country level

Program-oriented Topics:

More reviews or technical advice about programmatic issues or practical implementation of research findings.

Micronutrient deficiency in burden of disease and implications for development. Information on what works best/best practices in developing countries with the most significant impact on health outcome are desirable.

I think that you should continue sharing different strategies about how to encourage reduction of micronutrient deficiencies around the world.

About projects that have been applied worldwide about micronutrients

Country experiences in developing micronutrient policy. New research in vitamin A deficiency, iron deficiency, and other micronutrient deficiencies like zinc, selenium.

I think the publications covers a wide aspect about micronutrients. Maybe it needs to enhance educational activities, by increasing the publication of different field experiences in the world.

Case studies, new cut-off level, more intervention

Programmatic best practices

Community experiences on iron fortification; interactions iron supplementation/malaria and infections.

Program experiences from other countries in postpartum vitamin A supplementation

Practical guides are always best--what should clinicians and public health practitioners in the field should know about latest advances and how to implement them.

Action research that leads to project design, considerations to show most effective impact.

Review of project work and progress. Event calendar.

About the double supplementation with vitamin A in post partum and the treatment with different doses in anemia too. Today I am working on a survey with micronutrients (vitamin A, iron and zinc) in post partum and infants in the first six months.

Prevention of iron deficiency and improvement of folate nutrition by means of supplementation programs affordable by poor communities that are not reached by fortified foods.

Public-Private Partnerships:

Anemia, cost of malnutrition, benefits for companies to work along corporate social responsibility aspects, partnerships with industry, compliance and monitoring of fortification programs

Regulations:

The issue of case studies on legal monitoring and enforcement of mandatory standards

Upper Levels/Toxicity:

Nutrient Toxicity

Effects of vitamin A in healthy persons

Updates on Latest Research and Developments in the Field:

Recent investigations on vitamin, A, and Fe

All the new developments related to vitamin A and iron

Recent findings in research in ALL aspects of micronutrient research. Also, possible sources of getting support and grants and project sponsorships.

Most recent findings of micronutrient research that have a bearing on our understanding of how micronutrients are processed by the body so that we are able to design appropriate implementation and monitoring systems.

Nutrition, vitamins latest research, public and community health

Just continue publishing all the latest updates relative to micronutrient programs (supplementation, fortification, etc)

More new research-oriented articles

Topics are good but often fail to keep up with changes in the research areas

Progress reports

Basic reviews

Accurate yearly information of the level of deficiencies in different countries. Some achievement made in solving the nutritional problem of an area and how it was done.

Results of operational research

Recent advances in micronutrient research

Periodic updates on recent developments in the field

Results based on research, surveys, worldwide trends, micronutrients in the future, any latest developments on the topics.

Zinc:

Research on zinc, anemia and diet

Topics on zinc

Zinc which is very much related with iron and copper

Magnitude of zinc deficiencies, its correlates and adverse effects and results of various interventions.

Use of anthropometry data for decision making. Effectiveness of zinc supplementation on child survival. Goitrogens and they come into locally available African diets.

Zinc supplementation, dark adaptation for VAD assessment, VAD pregnancy, dietary assessment

Specific reviews on zinc supplements

More information on global Zn deficiency

Zinc nutriture

National program and its evaluation (zinc coverage)

Analysis of zinc, thalassaemia and anemia, nutrition education on anemia and vitamin A

Controversial aspects on zinc nurtiture

Zinc

Appendix I4

Survey Q 11. Additional comments?

Suggestions for additional topics:

I would like to know what implications nutrient deficiencies have on early infancy.

Effect of vitamin A deficiency on fetal development.

Currently, I am working on a health and nutrition project with pregnant women and children under three years of age, with the objective of growth promotion and early development in poor communities of Peru. I would like to have information on topics related with early infancy. Thank you, Lady Pillaca Ogosi, Nutritionist.

There is not much information about that. Supplementation issues and fortification issues are good, but dietary diversification have a little information, especially about community based trials.

Dissemination of information and training on quality control of fortified foods distributed in social programs.

Desire to receive information on iron deficiency in the woman (in Spanish). I take this opportunity to thank for the free mailings of some publications (IVACG, INACG).

Breastfeeding and HIV is still a concern with a lot of people. Yes, this is probably perpetuated by companies. UNICEF and WHO say if the formula feeding is not AFASS then exclusive breastfeeding for six months is recommended. But we still need more scientific information.

Research about: The place of vitamin A in the prevention of the infections and the somatic development of new - born hypotrophic severe (1500 G).

I think today we know that the problem of anemia is not a single nutrient problem but a multi-nutrient one. We should stop speaking of iron deficiency/anemia -- if we are honest we know iron alone does not cure the problem so why is everyone so afraid to address this issue?

Any current information on inter-relationships among micronutrients.

Also, I like information about cooperation research in micronutrients.

Evidence-based topics on overdose of vitamin A and its safety on children. Research on lipidol supplementation in relation to sex, age, status of iodine deficiency.

Review and newsletter on nutrition related disorders, particularly selenium, zinc will be useful for me. Information on nutritional data analysis methodology for researchers.

Request for regular updates on anemia intervention programs.

Many activities in such countries have not been presented in the Newsletter.

Comments related to access to publications:

Could you please make your publications more accessible especially to government and academic institutions. Thank you.

Consider sending hard copies to people in developing countries that can not easily manage to buy.

Your publications are very good, they should be better disseminated, especially in our countries [Spanish-speaking]. Especially considering that access to new information is very expensive for us. Access to it permits us to adapt it to our reality. It would benefit to publish more in Spanish. (Sus publicaciones son bastante buenas, deben ser mejor difundidas, sobre todo en nuestros paises. Mas aun considerando que el acceso a la informacion actualizada es muy cara para nosotros. El uso de la mayoria de ellas (a las que he tenido acceso), permite adecuarlas a nuestras realidades. Convendr¡a publicar mas en el idioma espanol.)

Complementary copies should be sent to those of us teaching and carrying out research in Universities in developing countries because of lack of funds to order copies regularly. Up until now I have always borrowed copies from colleagues in the National Department of Health. Kindly include me in your complementary list.

I am not really aware of any IVACG publications other than what I receive in the mail, and what I get as part of the IVACG meetings. So, perhaps better promotion of your publications on an annual basis through a single announcement via email or postal mail.

I wish I could receive more free copies of publications and announcements of new publications via the internet.

Spanish language

Next meeting in various languages, please.

Low-cost editions may be brought out in local languages aimed at regions where nutritional deficiency continues to be a public health problem.

You need to emphasize more on the Arabian gulf countries.

In India there is a need for the next IVACG and INACG meeting.

Your publications are excellent. Try to have workshop, meeting in South Asia, Pakistan, Nepal, Sri Lanka, Bangladesh, Afghanistan, if possible, so that a number of researchers can interact with each other.

I appreciate your mailing services. Your info through email and others is marvelous. Keep it up. Please you can start French edition though I can't speak it but many people do and they will appreciate it.

Anyway is there chance for reducing the cost of the publications to reach more people in East Africa?

For those in developing countries kindly keep providing free copies. Sometimes it is to expensive obtain a copy yet the contents are just what is right for our situation.

Re Q8: For leaflets a PDF download is sufficient, but for books/reports it is extremely useful if, in addition to PDF downloads, access to free hard copies could still be provided for people living/working in developing countries. I hope you won't stop providing this excellent service.

Keep your publications short and easy to read. Perhaps more illustrations.

Requests to be added to the mailing list:

Enlist my name on your post mailing list for publications.

Please check whether I am on the mailing list for notification of publications.

If you can advise us about any course by the internet, or any master.

Regular e-mail correspondence is required with researchers with micronutrient global leadership committee.

Would like to be receiving your publications.

I would like to be registered as a member. What should I can do?

Individual participant comments be analyzed and shared among participants through the simplest means such as e-mails.

I am Fernando E. Viteri, my e-mail address is viteri@chori.org. Please send me announcements of publications and meetings by e-mail.

Comments related to IVACG meetings:

As above and to attend IVACG Meetings.

As above, more to attend the IVACG Conferences.

I wish to be wholy part of this initiative in Africa and Nigeria in particular. My limitation is funding. I wish to attend any of your meeting and conference as soon possible. Thanks.

It would be worthwhile if smaller researchers and academicians like us are given some funding and allowed to share our publications and papers too in meetings such as IVACG and INACG. This would not only boost our research in terms of quality, but also empower us.

We hope that the next conference of IVACG/INACG to be held on one of the Middle East countries for the ease of attendance of a large number of researchers in the field.

It will be highly appreciated if the poster sessions are under different subjects/topics and best posters are awarded with a certificate, under each category.

It is better to have more information about the workshop news, research cooperation opportunity.

Announcing and organizing workshops in Arabic and/or African countries with laboratory trainings or practical demonstrations how to conduct a nutritional survey. This is could be conducted as a pre- or post congress. The IVACG held in Morocco could be organized in this manner. The distribution of the printed materials on the trainees during the training sessions.

Suggestions to invite additional experts:

IVACG is very undemocratic-run by a closed clique. The committee is self perpetuating. There should be elections either by mail list members or at the next IVACG meeting.

I think that other professionals would have opportunities to publish in INACG, and not only the same professionals. Other experiences would be published, and the INACG would help in translation for another languages. I think that ILSI Brazil would finance researches about anemia in the first infancy.

Policy-oriented comments:

More elaborate and convincing to government authorities.

I think that it is extremely important work to fortify the projects and proposals in the fight against undernourishment in the world. Communication of the investigations to the people in charge of the national politics is a good strategy.

Positive feedback:

I think you are doing a good work. Keep it up to help those of us from the developing countries.

Thanks for the survey. I would like to be informed of your meetings and events. I am supportive of teh necessary in Peru. Best Regards, Martha Miranda, Pharmacyst-Chemistry

Thank you for many, many excellent publications over many years.

Congratulations on your good publications!

I find the information to be very useful and an eye opener.

Otherwise the publications are good.

I participated last year in the last course celebrated in Peru -- it was really interesting, it encouraged me to research more in micronutrients and I would like to receive something like a catalog of the new publications.

Thank you

I wrote a book on biochemistry of the metabolic processes and iron plays a very important role in those processes; your information was very useful to me. Also your meetings represent a very good tool for my teaching since I have to be up date on my research and teaching. Please let me know when and where will be next year's meetings. Thanks.

The paper is very educative.

Thank you and congratulations.

I congratulate you on your work.

The publications of IVACG and INACG that I had access to were complimentary copies received directly from ILSI. The publications has been very useful in my current work on nutrition planning and coordination at the central level.

Thank you very much for all the pains you take to reduce micronutrient deficiencies!

Thank you to give us many useful information.

Thank you

Educational info for the general public.

Thank you for providing us the opportunity to give feedback, and sorry for writing in Spanish (Muchas Gracias por permitirnos opinar y mil disculpas por escribirles en espanol.)

Publications are very useful and they should continue. I wish in Spanish, because the language is one of the limitations for the students and other colleagues.

IVACG meetings are great and very useful!

Thank you for your establishing a mechanism for communication and information exchange.

It is a noble idea. Try to make it work. Thank you for making me part.

I have found your publications very useful and have always looked forward to their arrival. Issues of operational research have been particularly useful.

Doing a good job keep it up. Providing useful and timely info is like cold water to a thirsty man in the arid desert.

Thanks

Thanks

You are doing a good job. Keep it up.

Continue the present efforts.

Overall INACG and IVACG are useful groups and annual meetings are also interesting.

Very good publication I had one of my articles published in your publication.

I appreciate the fact that I am informed about your publications.

Congratulations to try to improve your publications. Well done.

I would like to offer my sincere thanks for the great efforts done by IVACG group and Iron Deficiency Project.

Many thanks for keeping me in the loop!

None. Thanks for your support.

Thank you for keeping me up-to-date with the latest in micronutrients, it is indeed valuable information.

Many thanks for your publications.

I like your methods to help many countries in the world. I always would like to participate in your meetings, and I would like to give you my own experience with the children in my country.

Thanks for the information you produce and communicate.

Very thanks

Many thanks for the packages via mail. At the same time sorry, but I would like to know when will be the next vitamin A conference.