

GUEST Editorial

ENDING HIDDEN HUNGER: IS THERE A WEAK LINK?

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This year, we celebrate one hundred years since the discovery of vitamins, marking a century of contributions that vitamins have made to human health with the “100 years of Vitamins Campaign,” to raise public awareness on the importance of vitamins for optimal health [1]. Many publications have been written about vitamins and the essential role they play in human health, detailing their best sources and nutritional requirements for the various types; specialized research papers describe their chemical structures, biochemical functions and clinical significance.

Vitamins and trace elements (minerals) are micronutrients which are required in miniscule amounts, but which play a major role in the biochemical reactions occurring in the body to maintain optimal metabolism and good health. Micronutrient deficiency also referred to as Vitamin & Mineral Deficiency (VMD), can compromise the effective utilization of macronutrients (protein, carbohydrates and fats) and ultimately lead to malnutrition [2,3]. Thus, an otherwise adequate diet, rich in macronutrients but deficient in micronutrients, often results in “hidden hunger” – a condition whose sub-clinical signs are not easily detected [2 – 4].

The impact of hidden hunger is multifaceted – it increases the risk factor for disease burden, and economic and social deprivation, because of its long ranging negative effects on the health of the affected individuals and the community as a whole [4, 5]. Hidden hunger can suppress the immune system, increasing the risk of developing infectious diseases and a wide range of metabolic disorders. This often leads to stunted growth in children, impaired physical, cognitive and psychomotor function, and, consequently, reduced capacity for critical thinking, impaired learning ability, diminished work capacity and reduced productivity [1 – 5]. In addition, hidden hunger can negatively affect outcomes of public health policies and strategies for the prevention and control of malaria, tuberculosis, HIV/AIDS and other diseases.

Hidden hunger affects over two billion people worldwide, with over one billion of them in the developing countries [5 – 7]. The greatest impact of hidden hunger is prevalent among infants, children and women in the low and lower-middle income group of countries [6 – 8]. Poverty is a major factor, responsible for the high prevalence of hidden hunger; reduced purchasing power limits people's access to a variety of foods in sufficient amounts. This usually results in poor dietary habits – daily consumption of starchy staples based on tubers, root crops, legumes and cereals, but lacking in micronutrient rich foodstuffs like fish, meat, poultry, eggs, dairy products, and a variety of fruits and vegetables [4, 5]. Other contributing factors include improper food preparation practices; poor knowledge of dietary requirements, especially for infants and young children, often stemming from feeding traditions and taboos; frequent infections which cause diarrhea and vomiting, especially harmful to infants and children; low bioavailability of micronutrients caused by anti-nutritional factors in ready-to-eat foods (for example phytates, oxalates, trypsin inhibitors, goitrogens, saponins and cyanogenic glycosides in some roots, tubers, legumes and cereals – these chelators can form complexes with divalent cations such as iron and zinc, inhibiting their absorption in the gastro-intestinal tract) [4, 5]. The levels of anti-nutritional factors can be reduced by appropriate processing and cooking of the foodstuffs. On a more general level, poor governance, local or regional conflicts, climate change and natural disasters can all affect the fragile low tech agricultural practices and the implementation of appropriate agricultural policies [5].

According to the World Health Report in 2000, hidden hunger is among the most serious health risk factors that contribute to the global burden of disease [9]. The deficiencies of Iodine, Iron, Vitamin A and Zinc were identified as the major causes of hidden hunger [9]. The inclusion of zinc is justified because recent scientific evidence associates zinc deficiency with low birth weight, stunted growth in childhood, reduced immune-competence, enhanced susceptibility to infectious diseases, diarrheal diseases and abnormal motor development [10, 11].

Several strategic initiatives for ending hidden hunger have been suggested since the World Summit for Children in 1990, the Montreal Conference in 1991 on “Ending Hidden Hunger” that approved formation of the “Micronutrient Initiative”, the United Nations (UN) Millennium Summit in September 2000 that put forward eight development goals, and several related meetings, symposia and conferences supported by UN agencies, donor foundations, non-governmental organizations, multilateral and bilateral agencies, and experts in academic and research institutions [2 – 4]. Over the last two decades, interest in hidden hunger has increased significantly, due to scientific data linking single and multiple micronutrient deficiencies to major issues in maternal and child health in developing countries [3,4,9-11].

The consensus of UN member states in the September 2000 millennium summit on the issue of setting up and approving eight millennium development goals (MDGs) to be achieved by 2015 was a major achievement in the fight against malnutrition [5,6,9,12]. It helped policy makers in member states, especially in the developing countries, to adopt and implement comprehensive intervention strategies and policies for reducing the scourge of hidden hunger among the vulnerable groups in their

populations – infants, young children and women. Six of the eight MDGs are either directly or indirectly related to hidden hunger: eradication of extreme poverty and hunger; universal primary education; gender equality and women empowerment; reduction of child mortality; improvement of maternal health; combating HIV/AIDS and reducing prevalence of malaria and other diseases [5,6,9,12].

The enthusiasm with which the political commitment to achieve the MDGs by 2015 was made was not long-lived; inconsistencies in the planning and implementation of intervention strategies by policy makers, program planners and implementers in many developing countries make the attainment of these goals, at this stage, rather unlikely [5].

Scientific publications on hidden hunger list supplementation, fortification, biofortification, dietary diversity (food-based strategies) and nutrition education as the recommended strategies for combating hidden hunger [4,9,13,14]. These strategies are complementary and not mutually exclusive – no single strategy can solve all the problems in any given country. An important pre-requisite for implementation of any of these strategies is the need for policy makers and program planners to identify the optimal combination of intervention strategies that fits the specific requirements in their country. It is also important to know the advantages and limitations of the various strategies.

Supplementation is a short-term strategy that can be used as part of health care or in specific nutrition campaign. It is the fastest approach for targeting individuals or population groups. It involves provision of concentrated micronutrients (food supplements) in the form of tablets, capsules, syrups or injections to provide optimal quantity of one or multiple micronutrients that are highly absorbable and bioavailable [3 – 5,14,15]. Successful practical outcomes of supplementation among the nutritionally vulnerable groups in developing countries are numerous; examples include iron and folic acid supplementation for women before and during pregnancy, to reduce anemia and neural tube defects in neonates; and vitamin A supplementation for children below two years of age – UN “Scaling Up Nutrition” (SUN) initiative, which should be implemented in all developing countries [14,16]. Despite the shining success of supplementation programs, they have been characterized as a “top-down” intervention developed in the “First World” that creates dependency on nutrients manufactured in industrialized countries [4]. For a supplementation program to succeed, appropriate budgeting is required to ensure the availability, appropriate storage and effective distribution of the supplements. In addition, effective monitoring programs should be put in place to avoid any misuse (inadequate or excess intake) of the supplements, and to actually ensure that they are taken by those who need them.

With effective planning, the supplementation strategy can be complemented and gradually replaced by food fortification as a medium-term strategy. Food fortification is the addition of a specific micronutrient or selected micronutrients to popular foods or a particularly common food item (used as vehicle), widely consumed by a target group, community, in a country or region [9,13,14]. It is a public health intervention strategy for effective control of hidden hunger when the fortified produce is accessible

and easily available in adequate amounts in the target population. When properly implemented, it tends to have a wider and more sustained impact than supplementation. Food fortification has achieved several remarkable practical outcomes in the fight against hidden hunger [5,13,17 – 20]. Examples include the fortification of salt with iodine, which has resulted in a significant decline in iodine deficiency disorders (IDD) across the globe; Micronutrient Initiative (MI), which, in collaboration with the World Bank (WB) and Canadian International Development Agency (CIDA), developed iron premix for fortification of iodized salt to produce the double fortified salt (DFS) for the control of iodine deficiency (ID) and iron deficiency anemia (IDA); the Flour Fortification Initiative (FFI) which, working with the International Association of Operative Millers (IAOM), celebrated the 10th anniversary of wheat flour fortification with iron or folic acid – thus fortified flour is now available in over 75 developing countries [9,13,14,17]. Significant progress in the control of hidden hunger has been reported in South Africa, after implementation of the multi-micronutrient flour fortification programs [5,9]. Vitamin A enriched cooking oils and vitamin enriched rice and cereals are sold in various outlets in the urban centers of most developing countries.

Despite these and other successful fortification programs, there are specific issues that program planners and policy makers in low and lower-middle income countries must consider. The feasibility of food fortification programs for rural populations must be appropriately addressed. Poverty, which may result in low purchasing power, poor distribution network and limited market outlets, can restrict access by the rural and remote rural population to the fortified products. Effective procedures must be put in place to ensure that the nutritionally vulnerable and economically disadvantaged individuals in the community have unrestricted access to the fortified products. For effective consumer protection, there should be government policies to regulate food fortification and to enforce implementation of the Food and Agriculture Organization (FAO) guidelines for food fortification [5,9]. The role of the private sector, especially the food and food related industries, is crucial in ensuring the sustainability and effective implementation of food fortification programs. Although the level of involvement of the private sector and government should be clearly defined, the major aim must be to combat hidden hunger; thus, the programs should not be profit-driven.

A complementary strategy to food fortification is biofortification, which involves using the best conventional breeding practices and modern biotechnology to develop high yielding varieties of micronutrient-dense staple crops [5, 9, 13].

Biofortified food staples with high amounts of micronutrients are recommended for use in developing countries to combat hidden hunger [5,9,13]. Examples include the orange-fleshed sweet potato and cassava (manioc) with high levels of beta-carotene (pro-vitamin A) and varieties of beans and grains with high iron content. Biofortification strategy effectively reaches the more vulnerable populations in remote rural areas, because biofortified seeds can be supplied to them for cultivation in their family or community gardens [5,13]. Thus, the main advantage of biofortification over commercial fortification is that the biofortified crops can be grown in the poor and remote communities.

The downside of this strategy is that there are still controversies over the long term effect of consuming some biofortified products [5,13,14]. There is therefore the need for policy makers and program planners to ensure that only biofortified products approved by WHO, FAO and other reputable international agencies are imported and used in the country. This will require the implementation and monitoring of robust government policies and guidelines for the regulation and the distribution of approved biofortified products. The lack of consumer acceptance of biofortified products has been one of the major obstacles to successful implementation of approved biofortification programs. It is therefore important that, prior to the implementation of such programs, appropriate awareness campaigns be carried out among small and large scale farmers, and that their concerns be noted and addressed before and after disseminating biofortified seeds [9]. In addition, government agencies, in collaboration with all stakeholders, should conduct consumer awareness campaigns to popularize the use of quality tested biofortified products, in order to reduce hidden hunger in the community.

One of the major objectives of all intervention to combat hidden hunger is to implement a sustainable long-term strategy for the provision of easy access to a variety of micronutrient dense foodstuffs which are also high in energy and protein content, making them readily available for consumption in target communities. Dietary diversification or food-based strategy is the recommended option, especially for the rural poor in the low and lower-middle income countries [5,9,14]. It must ensure self-reliance in appropriate food production and utilization at the community, village and household levels. This strategy requires extensive planning, because of the need to identify factors that can hinder the implementation at the various levels. Some of these factors, and suggested strategy modifications to counteract them, have been highlighted by FAO, WB, and other funding agencies and stakeholders involved in the fight against hidden hunger [5,14]. These factors include poverty, landlessness, lack of basic agricultural infrastructure, poor soil quality, harsh climatic conditions, poor water supply, poor sanitation, poor transport facilities, poor food preservation and post-harvest storage facilities, inadequate food preparation practices, cultural habits, lack of empowerment of women, ignorance of best infant feeding practices and lack of basic nutritional education.

To counter some of these factors, a multi-sector approach, using a mix of programmatic interventions, has been implemented in some developing countries [5, 12 – 14]. A major demand to all responsible governments who have not yet taken action is to pass relevant legislation for the implementation of land tenures and distribution of reasonable plots of land to families in the rural and selected urban areas, for farming and small- scale food production.

Government policies should ensure that all relevant agencies collaborate with stakeholders to provide appropriate financial and other support needed to introduce/strengthen small-scale vegetable and fruit production, home gardening, small-scale animal husbandry (poultry farm, fish farm, piggeries, ruminants or other small scale animal farming). Technical and financial support is also required for the introduction

of basic agricultural technologies, organizing basic nutritional education (with regard to making appropriate food choices, food preparation methods, practical ways of food preservation and storage, in order to minimize post-harvest losses); close collaboration and cooperation amongst farmers must be encouraged for effective distribution and access to the variety of foodstuffs produced in the communities; empowerment of women is also of paramount importance, to enhance their involvement in decision making in the household [5,9,14,21].

Effective public health and community health policies should be included in all food-based sustainable intervention strategies, because poor sanitation, inadequate disease control measures and high prevalence of infection are often correlated with hidden hunger [4,5,21]. An effective strategy should also include specific initiatives to improve maternal and child health.

One example of successful implementation of a food-based strategy is the Helen Keller International (HKI) homestead food production program to combat hidden hunger [9]. The integrated mixed programmatic intervention, involving home gardening and animal husbandry, resulted in a substantial increase in dietary diversification and consumption of animal products. The reported impact was a marked reduction in the prevalence of anaemia among children in the communities. Other examples include the “Millennium Village (MV)” projects in Mwandama (Malawi) and other developing countries. The MV project is a multi-sector program that involves integration of health care, education, agriculture and empowerment of women. According to the UN Secretary-General, effective implementation of the MV projects can be a major impetus for countries to achieve the MDGs [22].

The political commitment of UN member states to achieve the MDGs by 2015 has put nutrition at the top of the global development agenda, with a major focus on hidden hunger. The remarkable progress in combating hidden hunger in some developing countries is partly due to the unprecedented collaboration between governments, UN agencies, NGOs, donor foundations, multilateral and bilateral agencies in the areas of implementing diverse multi-sector food-based intervention strategies, nutrition education, food safety measures, agricultural development and the empowerment of women, as well as in organizing awareness campaigns and introducing effective public and community health policies [23].

However, despite all the accumulated knowledge and experience of the strategic options for combating hidden hunger, it is still a major problem in the low and lower-middle income countries, especially in sub-Saharan Africa [5,7,23]. The MDG summit of world leaders, held in New York in September 2010, concluded that the know-how for the achievement of the MDGs exists, but progress requires a focus on proven strategies, policies and interventions, as well as making a radical break with those that have not worked. Two years after the 2010 MDG summit and three years before the 2015 deadline for achieving the MDGs, several sub-Saharan African countries are still behind schedule [23]. The diplomatic tactical explanation attributed this failure to various natural disasters, droughts, high food prices, and the impact of the recent international financial and economic crises that led to both internal and

external fiscal austerity measures [7, 23]. While these explanations are tenable, the lack-luster approach, poor planning and inadequate implementation of intervention strategies by government agencies in some of these countries should be noted. The chronic dependency syndrome on international aid is one of the major reasons for some governments to cut back budgets for non-crisis intervention programs related to hidden hunger and to drastically reduce investment in agricultural programs for sustainable growth.

International development assistance in the fight against hidden hunger is an important temporary solution for low and lower-middle income countries; these governments need to invest in intervention programs to ensure their long-term sustainability for the nutritional, social and economic development of their populations [5]. New political incentives, institutional arrangements, modification of some existing policies and introduction of new ones are needed to overcome the bureaucratic bottleneck, which is one of the major hindrances to effective implementation of multi-sector interventions strategies which link agricultural development, dietary diversity, adequate access to affordable and quality nutrition, as well as improved maternal and child health – all in order to combat hidden hunger.

In order to strengthen multi-sector interventions, it is also important to identify the weak links between various strategies / programs. Inadequate knowledge of the 'hidden hunger' concept on the part of some implementers and ineffective awareness campaigns to combat hidden hunger at the household level represent the weak links. Implementation of the multi-sector approach to combat hidden hunger requires effective participation of workers from the various sectors (health and agriculture extension workers, community workers, teachers, church officials and community volunteers). These implementers require appropriate guidelines and basic knowledge about hidden hunger for achieving success in their village or community outreach. They should be able to give clear and precise answers to questions related to the cultivation of micronutrient dense foodstuffs. Team leaders should be able to organize focus group meetings at the community or village level involving the male heads of households, to foster the participatory approach that includes women in decision making.

Enhanced awareness campaigns should be carried out routinely. For example, information discussed at major meetings and their outcomes should be widely publicized in the community, using all means possible, such as the local print media, radio and television talk shows and newsletters in all the local languages and dialects. This will generate community awareness of the issue and better understanding of the threat hidden hunger presents to each individual and community health. New technologies, such as mobile phones/ SMS texting have proven to be an effective means of communicating health messages to community members.

Efforts should be made to ensure that the concept of hidden hunger is understood as widely as possible, in order to gain community support for the intervention strategies used. This will encourage active public participation and generate useful suggestions and feedback regarding strategy modifications, changes and some common sense choices in overcoming hidden hunger. Successful implementation of such programs

can even engender community-based initiatives, such as “*Community and Household initiative against hidden hunger*”.

In conclusion: as the second century since the discovery of vitamins commences, nutrition is at the top of the global development agenda, with a major focus on the elimination of hidden hunger. The 13-year plan (2012 to 2025) to address maternal, infant and child nutrition, adopted during the 2012 World Health Assembly, is a welcome initiative that will keep the world focused on malnutrition and hidden hunger in the first quarter of the 21st century. The unprecedented collaboration between governments, UN agencies, NGOs, donor foundations, and multilateral /bilateral agencies in the implementation of diverse multi-sector food-based intervention strategies, and in promoting nutrition education, food safety measures, agricultural development and the empowerment of women, as well as in conducting awareness campaigns and shaping public and community health policies is partly responsible for the remarkable progress in combating hidden hunger in some developing countries. Stakeholders need to refocus and redirect resources towards improving the “train the trainers” programs for implementers in the field. The zero hunger challenge (ZHC) declaration by the UN Secretary-General in May 2012 is a welcome initiative that will further enhance the collaboration between stakeholders to strengthen their efforts in fighting hidden hunger and malnutrition in the developing countries.

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