

ATTACHMENT III: WHERE WE WORK AND WHAT WE SUPPORT – AN EVIDENCE BASED APPROACH WHY WE SUPPORT NUTRITION INTERVENTION

Malnutrition today is generally characterized by the World Health Organization (WHO) as being either: i) over-nutrition, the outcome of too much food intake, or ii) under-nutrition, the outcome of insufficient food intake AND repeated episodes of infection. Generally speaking, under-nutrition has 2 major determinants, including both quantity and quality of food intake. The *quantity* of food intake as compared to a generation ago, globally, is largely adequate for most people to meet the minimum requirements for energy (with certain exceptions pertaining to populations experiencing famine or displaced refugee populations experiencing sudden food shortages). By contrast, the *quality* of food intake is still a significant problem globally. The major concern with food quality is whether the daily diet of the poor contains adequate trace amounts of vitamins and minerals (essential micronutrients – micronutrients not manufactured in sufficient quantities in the body and must be obtained from external sources) required for growth, development, and physiological functioning.

Because micronutrient deficiency is not associated with any dependable and visible indicators of deficiency (except in extreme cases), essential micronutrient deficiency is now commonly referred to as “hidden hunger” in the popular press. Hidden hunger is widespread, especially among the poor, because the poor in developing countries tend to derive most of their food intake from consumption of staple crops – all of which are deficient in one or more essential micronutrients. Of the planet’s approximately 7 billion inhabitants, roughly 2 billion are under-nourished, and roughly 1 billion are profoundly under-nourished. Such deficiencies on a population basis lead to significant portions of the population being classified as “under-nourished”, and experiencing the known, adverse consequences of under-nutrition.

The overall rationale underlying why we support nutrition intervention is related to the consequences of under-nutrition. Robust evidence exists to show that under-nutrition:

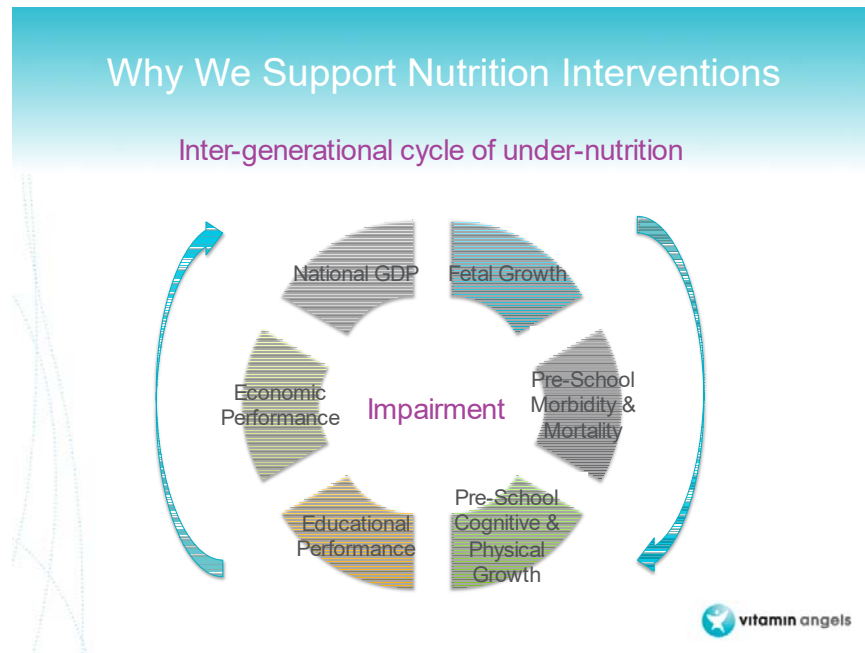
- Has immediate and long term negative consequences that are significant in magnitude,
- Is self-perpetuating and inter-generational in nature – supporting a cycle of deteriorating health and economic under-performance, and
- Is associated with a significant, net negative effect on GDP; and importantly, under-nourished children without benefit of nutrition intervention grow up to form families that are predictably both poor and under-nourished.

More specifically, as visualized below in **DIAGRAM 1: WHY WE SUPPORT NUTRITION INTERVENTION – AN INTERGENERATIONAL CYCLE OF UNDER-NUTRITION**, there is a cycle of impairment that is sequenced roughly as follows:

- Under-nourished women tend to experience significant anemia, with consequences attendant to their own health and the unborn child or children they are carrying,
- Under-nourished women of reproductive age experience pregnancies that suffer impaired fetal growth and decreased birth weight,
- Unborn babies that develop within the nutritionally deprived environment of an under-nourished mother are more likely to experience poor fetal growth, and therefore at increased risk for increased neonatal and infant mortality,
- Newborns that survive fetal impairment, subsequently, are likely to experience increased morbidity and mortality in the first few months of life and the first 5 years of life; and if these infants and young children survive through the first 5 years of life, they are likely to experience impaired physical growth and cognitive development during this same period,

- Under-nourished children who survive to their fifth birthday subsequently experience impaired educational performance in school, and experience impaired economic performance while in the work force, and
- Nations that experience under-nutrition among significant portions of the population throughout the first 1000 days from conception to 2 years of age can expect that national GDP will be impaired by about 8%; and perhaps most importantly, those who experience and survive under-nutrition in the first 1000 days from conception to 2 years of age will themselves form families that are also both poor and under-nourished – thus, repeating the cycle over again.

Diagram 1. Why We Support Nutrition Intervention – An Intergenerational Cycle of Under-nutrition

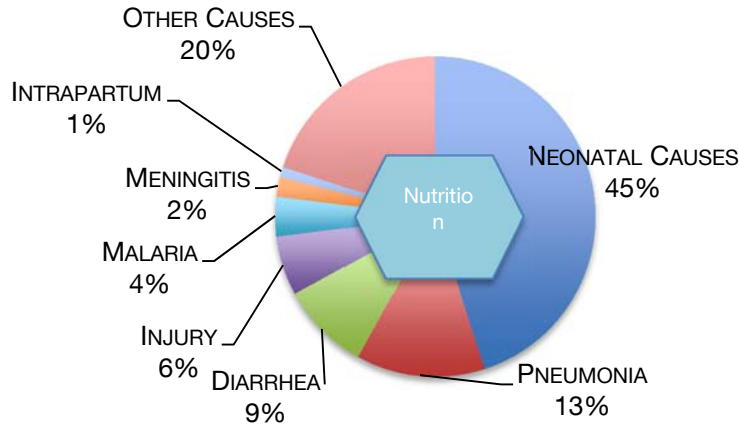


The impairment described above, however, is even more compelling when contextualized with magnitude of effects. As visualized below in **DIAGRAM 2: WHY WE SUPPORT NUTRITION INTERVENTION – IMPACT OF UNDER-NUTRITION ON HEALTH**, we see that there are generally few deaths caused directly by under-nutrition. Nevertheless, under-nutrition is an underlying cause of death among 45% of all PSAC. If under-nutrition could be eliminated as an underlying cause of death, about half of all preschool-aged child deaths could be eliminated. Thus, under-nutrition at the beginning of life has huge immediate consequences, but also continues to impact every individual’s life throughout their lifetime.

Diagram 2. Why We Support Nutrition Intervention – Impact of Under-nutrition on Health

WHY WE SUPPORT NUTRITION INTERVENTIONS - IMPACT UNDER-NUTRITION ON HEALTH CAUSES OF DEATH AMONG CHILDREN <60 MONTHS

(UNDER-NUTRITION IS RARELY THE CAUSE OF DEATH, BUT IS AN UNDERLYING CAUSE OF 45% OF ALL PRE-SCHOOL CHILD DEATHS ≈ 3M DEATHS PER YEAR)



Notes to above diagram ³:

1. Neonatal deaths (i.e., deaths among children in the first 28 days of life) represent 45% of all deaths among children less than 60 months of age. Shown in the table below for all neonatal deaths of deaths from each “neonatal condition” that occurs – percentage of all deaths among children less than 60 months expressed as a of age.

16% Pre-term Birth Complications
11% Intrapartum-related events
07% Sepsis
05% Congenital abnormalities
03% Other neonatal disorders
03% Pneumonia
<1% Tetanus
<1% Diarrhea

2. The category labeled as “Other” deaths among children less than 60 months of age includes death from the causes shown in the table below. Each is expressed as a percentage of all deaths among children less than 60 months of age.

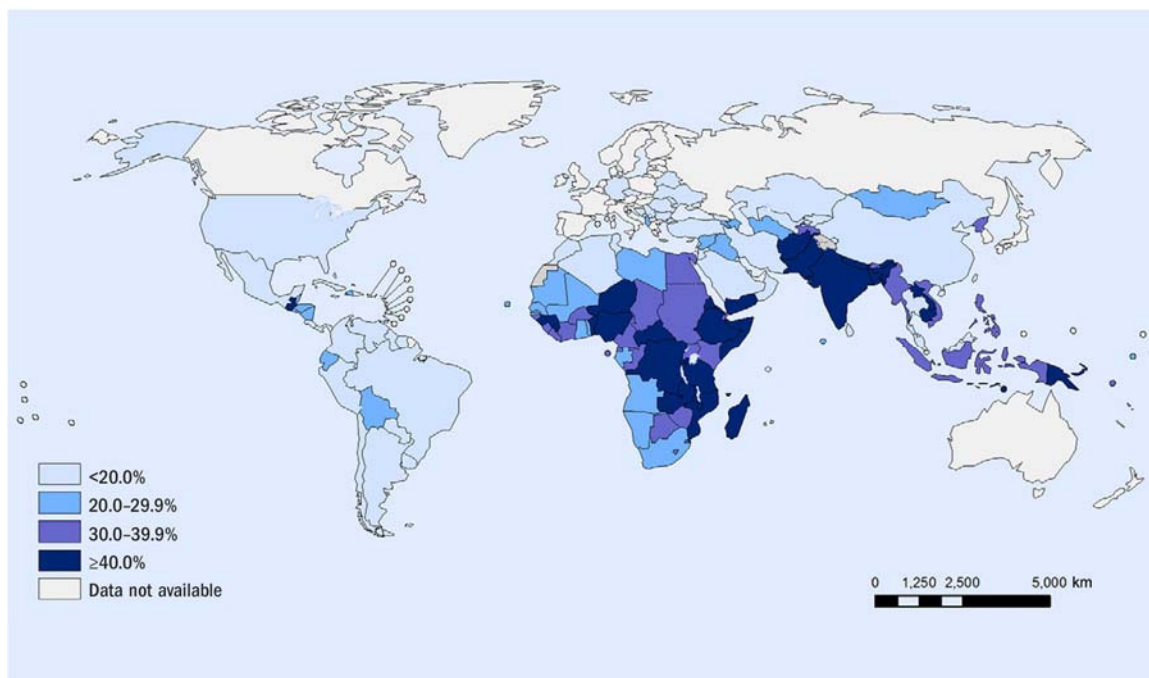
04% Congenital abnormalities
02% Pre-term birth complications
01% AIDS
01% Measles
<1% Pertussis
11% Other/Unknown disorders

³ Liu L, Hill K, Oza S, Hogan D, Cousens S, et al (In Press). Chapter 4. Levels and Causes of Mortality Under Age Five. In: Black RE, Laxminarayan L, Walker N, Temmerman M, eds. Disease Control Priorities 3rd edn. Volume 2. Reproductive, Maternal, Newborn and Child Health. World Bank. Washington, DC. 2016.

WHERE WE WORK AND WHY

Globally, between 2 – 3 b persons are believed to suffer from under-nutrition, but VA is most concerned with the 1 b persons profoundly affected by under-nutrition. To illustrate the distribution of these individuals' location, it is useful to examine Figures 1 and 2 below. Figure 1 shows global under-nutrition represented as the prevalence of stunting among PSAC. While Sub-Saharan Africa and Southeast Asia show significant percentages of PSAC (i.e., less than 5 years of age) as being under-nourished, the absolute numbers of stunted children are most concentrated in Southeast Asia. Indeed, India has the largest absolute numbers of stunted PSAC globally – estimated to be about 35% of all children globally; and preschool-aged child deaths among Indian children represent 50% of all preschool-aged child deaths globally. After India, Nigeria is home to the next largest number of stunted PSAC and preschool-aged child deaths. After these countries plus an additional 5 nations, their populations make up more than 75% of those persons who are profoundly under-nourished. The general global distribution of under-nutrition (combined with the magnitude of the consequences of under-nutrition, including the numbers of deaths among preschool-aged child deaths) compels VA to focus its resources in target countries (for a detailed discussion on how VA selects “target” countries and “administrative priority”, including the global ranking documents used to facilitate identification of target countries, see information associated with each figure below, and especially a discussion in the sub-section at the end of this attachment entitled: **ADDITIONAL CONSIDERATIONS UNDERLYING VA’S PROGRAM TARGETS**) in Southeast Asia and Africa, and a much smaller portion of its resources on pockets of under-nutrition in the Americas (including the U.S. and Canada).

FIGURE 1. COUNTRY PREVALENCE ESTIMATES FOR STUNTING AMONG CHILDREN UNDER-FIVE YEARS OF AGE. LEVELS & TRENDS IN CHILD MALNUTRITION. UNICEF – WHO – THE WORLD BANK ESTIMATES. 2012.



The global distribution of vitamin A deficiency among PSAC is significant and is reflected in Figure 2 below, which is expressed as the “Hidden Hunger Index” (HHI). HHI itself comprises information about vitamin A, zinc, and iodine deficiencies among PSAC globally. Not unexpectedly, HHI shows a general global distribution of vitamin A, zinc and iodine deficiency that is similar to that which occurs for stunting among

PSAC. In practice, VA is committed, generally, to focus its resources on vitamin A supplementation and multi-vitamin supplementation primarily in Southeast Asia and Sub-Saharan Africa while expending a much smaller portion of resources in the Americas.

Figure 2. Global Hidden Hunger Index for Children <5 (Based upon prevalence of vitamin A, zinc and iodine deficiencies.)

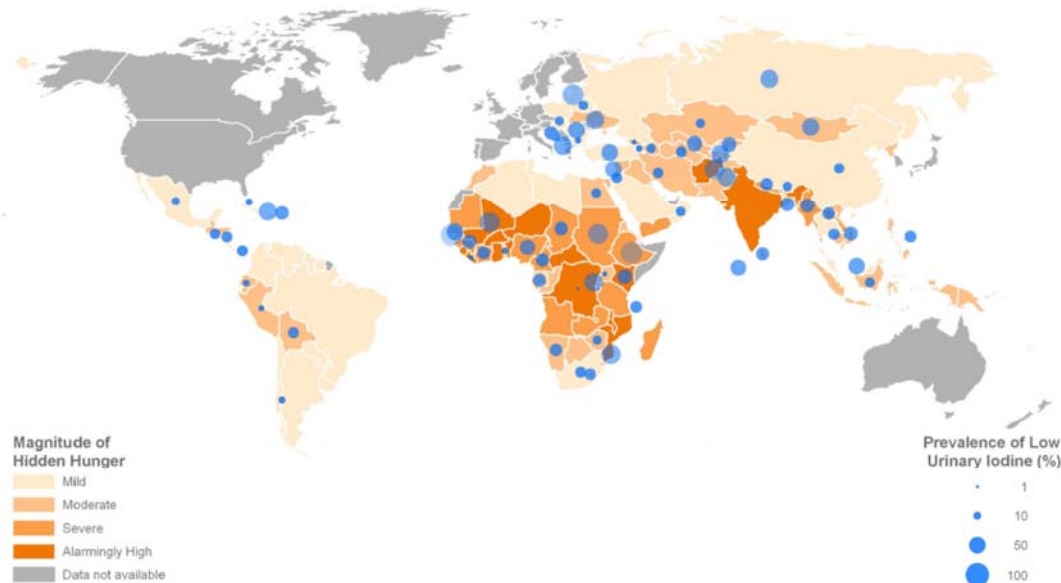
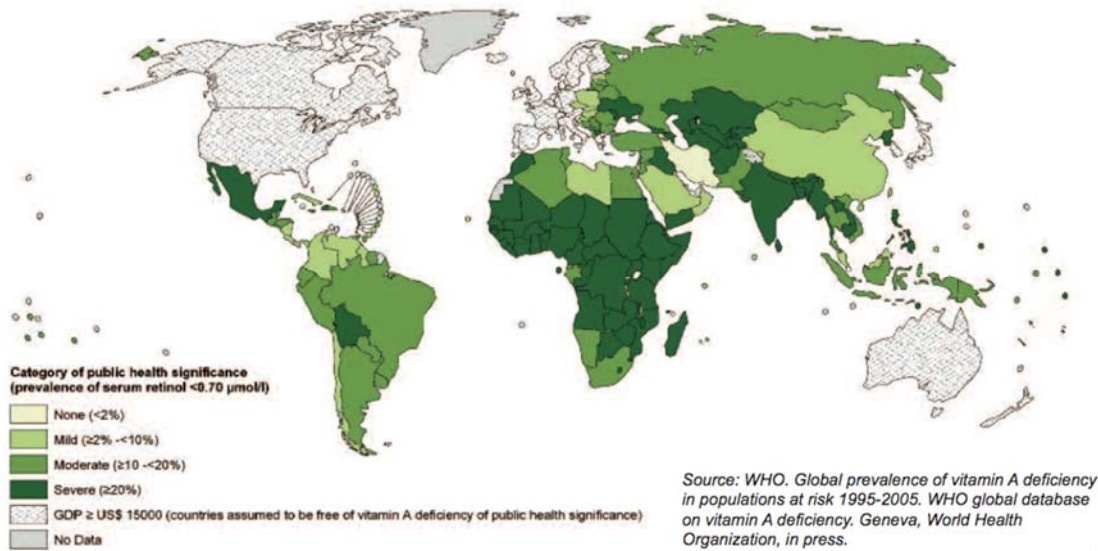


Figure 2. Global map presenting hidden hunger index based on the prevalence estimates (HHI-PD) in 149 countries and prevalence of low urinary iodine concentration in 90 countries with 2007 Human Development Index <0.9. The hidden hunger index HHI-PD was estimated based on national estimates of the prevalence of stunting, anemia due to iron deficiency, and low serum retinol concentration.

doi: 10.1371/journal.pone.0067860.g002

For comparison, Figure 3 shows the global distribution of vitamin A deficiency alone among preschool-aged children.

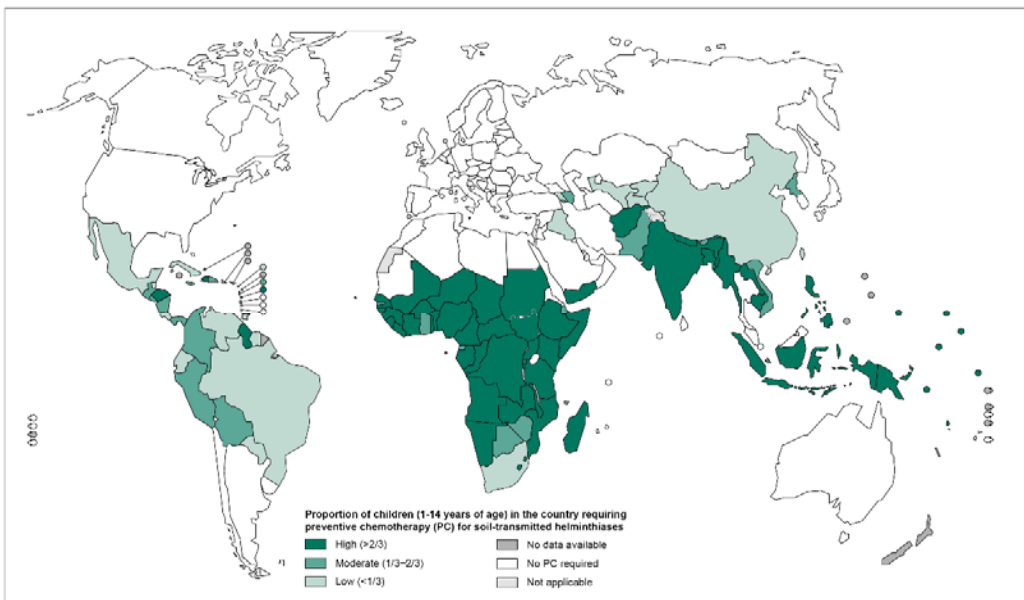
Figure 3. Global prevalence of vitamin A deficiency, children <5, 2004. The Lancet 371:245-255, 2008.



Building upon a general understanding of the global distribution of under-nutrition and a specific understanding of the regional distribution of under-nutrition by country, including vitamin A deficiency, VA decides where to work and what to support after consideration of many more locally focused factors. These include a more detailed examination of country-specific data used to generate/update a list of VA's target countries, coupled with an understanding of the potential availability of qualified field partners, especially indigenous NGOs, and other administrative factors that can influence how best to manage VA activities to select and support field partners in any given country. To support decisions about the deployment of albendazole in conjunction with vitamin A, VA uses newly available online global mapping tools that show the prevalence and burden of soil transmitted helminthes (STHs), and specialty expertise available from Children Without Worms.

Figure 4. Global prevalence of soil transmitted helminthiasis among children.

Proportion of children (1-14 years of age) in the country requiring preventive chemotherapy (PC) for soil-transmitted helminthiasis, worldwide, 2014



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement. © WHO 2015. All rights reserved

Data Source: World Health Organization
Map Production: Control of Neglected Tropical Diseases (NTD)
World Health Organization



WHAT WE SUPPORT AND WHY

VA connects vitamin A with infants and children 6 to less than 60 months of age through distribution of vitamin A supplements alone or in combination with the de-worming agent, albendazole, as recommended by the World Health Organization (WHO)⁴. VA promotes universal supplementation of vitamin A as recommended by WHO in countries experiencing moderate or severe vitamin A deficiency as a vehicle to save lives and reduce illness. VA distributes only vitamin A that is manufactured consistent with internationally accepted technical specifications and finished product specifications.

VA connects multi-vitamins with undernourished women of reproductive age (currently focusing on pregnant women, although we continue to deploy multivitamins to children in a small residual program). VA anticipates a significant expansion of distribution of multi-vitamins to pregnant women under the new strategic plan period. VA distributes various formulations of essential multiple micronutrient supplements – known commonly as “multivitamins” – in coated tablet or capsule form. Micronutrient supplements are distributed consistent with WHO recommendations where available and applicable². During the new strategic plan period, VA will move to distribution of products that conform, exclusively, to the UNIMMAP formulation developed by WHO for women. VA has developed with industry experts and academic experts, its own technical specifications and finished product specifications because none exist.

VA’s support is influenced by the following:

- » *VITAMIN A DEFICIENCY (VAD)*. 535 m children under age 5 years, concentrated in South Asia and sub-Saharan Africa⁵ are eligible for vitamin a supplementation. While xerophthalmia (i.e., a disorder of the eye that can lead to night blindness, corneal destruction and permanent blindness in children⁶ and adults) is a visible indicator of VAD, many more individuals with VAD show no signs of xerophthalmia. All infants and children who are VAD are at risk for reduced ability to resist infections (e.g., particularly, diarrhea and measles) that lead to excess mortality and morbidity. Consequently, eliminating VAD is among the most critical ways to save lives and reduce illness among undernourished infants and children aged 6 to less than 60 months. Under-nourished PSAC 6 to less than 60 months of age who receive regular vitamin A supplementation experience a mortality rate between 11% and 24% less than those not receiving vitamin A supplementation.
- » *ESSENTIAL MULTIPLE MICRONUTRIENT DEFICIENCY*. Apart from vitamin A, 4 other micronutrients (i.e., iron, folate, iodine and zinc) are demonstrated to be essential to proper growth and development, including for their effects on the development of the immune system, physical growth and cognitive development. Multi-vitamins normally containing 15 essential vitamins and minerals can be critical for undernourished pregnant women to help reduce anemia in the mother and promote fetal growth (and increased birth weight) of their developing and unborn child, and thereby reduce neonatal mortality^{7, 8, 9}; and can be important for promoting growth and cognitive development among undernourished infants and children.

² WHO – Guideline for Vitamin A Supplementation in Children 6-59 Months of Age, August 2011; and WHO – Guideline for Children 3-23 Month of Age, August 2011.

⁵ *Vitamin A Supplementation: A Decade of Progress*. UNICEF, 2007.

⁶ Ibid.

⁷ Usha Ramakrishnan, Frederick Kobina Grant, Tamar Goldenberg, Vinh Bui, b Aamer Imdad, Zulfiqar Ahmed Bhuttac. *Effect of Multiple Micronutrient Supplementation on Pregnancy and Infant Outcomes: A Systematic Review*. *Pediatric and Perinatal Epidemiology*, 2012, 26 (Suppl. 1), 153–167.

⁸ Zulfiqar A Bhutta, Jai K Das, Arjumand Rizvi, Michelle F Gaffey, Neff Walker, Susan Horton, Patrick Webb, Anna Lartey, Robert E Black. *Maternal and Child Nutrition*. The Lancet Nutrition Interventions Review Group, and the Maternal and Child Nutrition Study Group. www.thelancet.com Vol382 August 3, 2013.

⁹ Haider BA, Bhutta ZA. Multiple-micronutrient supplementation for women during pregnancy (Review). The Cochrane Collaboration.

Globally (including the United States), hundreds of millions of unborn children, infants, young children, and women of reproductive age are afflicted by under-nutrition. Alarmingly, about 54 m *more* children (and by inference, roughly 54 m more pregnant women) join their ranks annually. Given the well documented, immediate and long-term consequences of deficiency in essential micronutrients, and the robust evidence that supplementation with a “*multivitamin*” containing an appropriate combination of 15 essential vitamins and minerals (i.e., the UNIMMAP formula created by WHO) is better than use of iron + folic acid alone as an important way to combat the ill-effects of under-nutrition and help secure a healthy and economically productive future for unborn and new born children (both in the United States and internationally – while improving the health of women of reproductive age) VA will focus on scaling up this intervention.

- » *DE-WORMING AGENTS (E.G., ALBENDAZOLE) IN THE PREVENTION OF MICRONUTRIENT DEFICIENCY.* 75% of the countries with micronutrient deficiency are also endemic for soil-transmitted helminthes (STHs) – worms that infect the digestive tract. STHs magnify the problem of multiple micronutrient deficiency (including vitamin A deficiency) because they compete for micronutrients ingested – leaving even fewer micronutrients available to support growth and development. STHs are particularly harmful to infants and children because they require larger quantities of micronutrients to support rapid growth. Consequently, if a country needs vitamin A supplementation and STHs are endemic, it is important to consider simultaneous co-administration of vitamin A and a de-worming agent such as albendazole as a way to reduce the burden of worms and facilitate proper maintenance of vitamin A status. Fortunately, albendazole is inexpensive, effective and can be given at the same time as vitamin A supplementation (e.g., usually twice a year for children 12 to less than 60 months of age – with the side benefit of increasing participation in outreach campaigns).
- » *COUNTRIES IN GREATEST NEED.* WHO and UNICEF regularly identify countries experiencing *vitamin A deficiency* and categorize each country (generally re-stated annually), based on quantitative evidence, as experiencing severe, moderate or mild vitamin A deficiency. VA only promotes universal supplementation in those countries categorized as experiencing severe or moderate vitamin A deficiency. Because 37% of all vitamin A deficient children in the world live in India, VA is increasingly focused on identifying and supporting new grantees and implementation partners in India. After India, Nigeria is home to the next largest number of vitamin A deficient PSAC, and VA is investing to scale up deployment of vitamin A in that country. VA also works in all of the next most populous nations ranked by UNICEF as experiencing severe vitamin A deficiency. WHO and UNICEF have not created a ranking to guide multi-vitamin distribution in countries experiencing under-nutrition; thus VA relies on an examination of the relative prevalence of stunting globally (including use of the Hidden Hunger Index score) and opportunistic relationships to determine allocation of available multi-vitamin products – recognizing that need far outweighs availability of multi-vitamins. Allocation decisions will become more difficult only when vastly larger supplies of multi-vitamins are available. Which supplement product is granted to which field partner is determined by many factors pertaining to the field partner’s mission, target population, etc.
- » *POPULATIONS MOST AT RISK.* Based upon the most recent guidelines from the WHO (referenced earlier), the most effective interventions for universal supplementation are designed to target the following population groups:
 - Newborns, and infants 6 to <12 months of age,
 - Children 12 to <60 months of age, and/or
 - Women of reproductive age, including the unborn children of pregnant women.

Generally, those most in need tend to live in:

- Rural areas without any immediate access to facility-based health care services, or have limited access to health services through outreach or community-based services, or
- Urban areas without access to facility-based health care services, or have limited access to facility-based health care services that do not provide nutrition services.

Women and children targeted by VA are characterized as follows:

- Reside in families in the bottom third of the income pyramid,
- Are “hard-to-reach”,
- Have little/no access to government health services,
- Almost always reside where STH infections are endemic,
- Are recognized as among the largest nutritionally challenged population globally and suffer huge adverse consequences (e.g., disproportionate morbidity, mortality & inter-generational poverty and low educational/economic achievement), and
- If they have access to any health services, large numbers of these children access services through NGOs or other community-based organizations.

ADDITIONAL CONSIDERATIONS UNDERLYING VA’S PROGRAM TARGETS

- » *VITAMIN A.* Although there are roughly 535 m PSAC eligible to receive vitamin A supplementation each year, the Micronutrient Initiative, with funding from the Canadian Government and with collaboration of UNICEF, reaches roughly 70% of those children in need with some level of vitamin A supplementation annually. Despite these efforts, nearly 150 m children under age 5 years in need do not receive vitamin A supplementation. These at-risk children who are in need are VA’s primary target group. VA seeks to reach as many of these 150 m PSAC as feasible and believes that a substantial portion can be reached using our existing programming approach that focuses on NGOs. For the purposes of the Strategic Plan (FY 2017 -2019), VA believes that at least 75 - 80 m PSAC are within reach of NGO services, and that over the plan period, VA can assist networks of NGOs to reach 60 m of these children annually with incremental increases each year.
- » *MULTI-VITAMINS FOR PREGNANT WOMEN.* Based upon estimates made by the Alan Guttmacher Institute which concludes that 185 m women become pregnant each year in the developing world, VA assumes that all are undernourished and that about half have access to iron and folic acid during their pregnancy. The remaining 90 m undernourished pregnant women are assumed to be ones who could benefit from multi-vitamin supplementation. Presuming that roughly 30% of the 90 m women experiencing pregnancy in the developing world are eligible to receive services from the NGO sector, this translates into roughly 27 m women. Presuming that 50% of these women might actually be reached by services of an NGO, then 13.5 m women could be targeted to obtain multi-vitamin supplements during pregnancy from networks of NGOs. Such an effort would require roughly 5 b doses of multi-vitamins annually. While these estimates provide a basis for planning by VA, they should be viewed as very crude estimates and efforts should be undertaken to further refine these estimates. Presuming that 13.5 m women are in need and could access multi-vitamins from the NGO sector, VA can assume that its existing and expanding platform of distribution could reach a large portion of these women. Thus, there is for VA, a very significant opportunity for growth in meeting the needs of undernourished pregnant and lactating women for multi-vitamin supplementation using the same distribution platform that VA already uses to connect vitamin A with PSAC. Nonetheless, the actual numbers of pregnant women targeted to be reached in the Strategic Plan (FY 2017 – 2019) is set to be at a relatively modest level of at least 1-2 m pregnant women – primarily because VA will face many obstacles to: i) qualify manufacturing partners to meet VA’s technical product specifications, and ii) generate sufficient revenues to allow it to purchase sufficient product (or obtain gift-in-kind donations) to reach 13.5 m beneficiaries (eligible pregnant women).

- » *DE-WORMING AGENTS (E.G., ALBENDAZOLE)*. Importantly, while there is a global effort to implement deworming programs globally, until recently, the program was operated by the WHO. Due to certain constraints, the program has focused on school-age children. Recently, with prodding from the Bill and Melinda Gates Foundation, a new group, the STH Coalition has caused WHO to embrace a more expansive effort to eliminate (not just control) STH infections. The program has been somewhat stymied in that WHO continues to focus on school aged children supported by a generous long-term donation of pharmaceutical products from GSK and J&J that, by agreement, cannot be utilized for preschool aged children. Thus, support for preschool aged children must be from sources other than WHO – which constitutes a huge procurement challenge for the global community. On the positive side, albendazole is inexpensive and is easily co-administered with vitamin A – thus presenting VA with a powerful opportunity to help implement de-worming programs globally. To this end, VA along with World Vision and UNICEF are the only organizations able currently committed to deworming for preschool aged children. This is an obvious opportunity for VA to take a global leadership role with significant impact.

- » *PROMOTION OF OPTIMAL IYCF PRACTICES*. VA has long provided technical assistance materials to its field partners to support their efforts to promote breastfeeding and good complementary feeding practices. VA is committed under this new Strategic Plan period to provide a wider range of supports to field partners. While using these initiatives to reach more beneficiaries, VA will also need to identify a methodology for counting beneficiaries in the category so that VA can adequately quantify the effect of its support on beneficiaries or even beneficiaries reached.

- » *DIRECT FEEDING PROGRAM FOR PRESCHOOL-AGED (PSAC) CHILDREN*. While VA is keen to find alternative interventions for PSAC in the U.S. and other developing nations, including support for preschool feeding programs, the exact nature of these interventions is not immediately clear. Snack and full meal options are obvious, but there is a need for VA to fully examine a range of issues pertaining to timing, quantity/frequency, nutrient content, diversity, and appropriateness. There are also a number of logistical and field partner related issues that need to be researched before commencing a program at scale program. Should VA focus on identifying and assembling the contents of a snack or meal, or should VA support a package of foods already identified by field partners? What is the cost of such a program, and how can such a program be designed to avoid fatigue on the part of beneficiaries from a set package of snack/meal items? It is likely that VA will research these items and only engage in small pilot programs in the U.S. to learn how to support these programs before scaling them for larger numbers of beneficiaries.

- » *TOOLS USED BY VA TO IDENTIFY/TARGET AT-RISK POPULATIONS BY THEIR NATIONAL/REGIONAL GEOGRAPHIC LOCATION*. During the period from 2009 – 2015, VA defined its target population and target countries by examining data regularly published by UNICEF on vitamin A status. This has been appropriate given the preponderance of VA programming activity was support for vitamin A supplementation. Using these data as a guide, VA targeted the allocation of its resources by acknowledging that the Africa region had the most nations experiencing vitamin A deficiency (VAD), Asia (primarily India) had the largest absolute numbers of children experiencing VAD, and that the Latin America and the Caribbean region had the fewest children experiencing VAD. UNICEF published data, combined with data available from the Micronutrient Initiative, continue to make allocation of programmatic resources straightforward.

In 2015, VA recognized that changing health trends and significant improvements throughout the developing world associated with improving nutrition (including vitamin A status) would have an effect on the allocation of VA program resources. Application of information about changing health trends resulted in VA targeting the allocation of more resources towards programming in Africa and robust expansion of efforts in India.

Simultaneously in 2015, with the potential for increased resources in upcoming years, and a recognition of the significant public health impact of other categories of nutrition interventions that

address multi-micronutrient deficiency, VA began: i) exploring use of additional data sets to identify at-risk populations, and ii) using these data sets to assist with the allocation of resources. Emerging data sets on the incidence and prevalence of infections among preschool-aged children, including infections with soil-transmitted helminthes (STH infections) were adopted by VA to target resources; and through 2015 and 2016, VA has become more familiar with additional indices that reflect an aggregated view of multi-micronutrient deficiency, including:

- Global Hunger Index (as developed by the International Food Policy Research Institute – IFPRI), combining three equally weighted indicators into one index. It comprises:
 - Undernourishment: the proportion of undernourished people as a percentage of the population (reflecting the share of the population with insufficient caloric intake),
 - Child underweight: the proportion of children under the age of five who are underweight (that is, have low length/height for their age or low length/height/weight, reflecting stunting or wasting , or both), which is one indicator of child under-nutrition, and
 - Child mortality: the mortality rate of children under the age of five (partially reflecting the fatal synergy resulting from inadequate food intake and exposure to an unhygienic environment).
- Global Hidden Hunger Index – HHI (as developed through consultation among high-level scientists, academics and decision makers from a range of global institutions, including UN agencies, U.S. government agencies, universities and international NGOs) which is the average, for preschool children, of three deficiency prevalence estimates, including:
 - Stunting (as a proxy for zinc deficiency, as recommended by the International Zinc Nutrition Consultative Group),
 - Iron-deficiency anemia, and
 - Vitamin A deficiency (Low Serum Retinol) (<0.7 µmol/L).

The three components are equally weighted to arrive at a Hidden Hunger Score:

The Hidden Hunger score = [stunting (%) + anemia (%) + low serum retinol (%)]/3. Iodine deficiency was measured separately due to its weak correlations with other micronutrient deficiencies.

With the availability of multiple data sets and indices pertaining to undernutrition, and a changing repertoire of interventions that VA will support, VA will continue to identify “target countries” using a range of objective rankings of individual and multiple micronutrient deficiencies. However, VA will need to develop an overarching approach for targeting its resources – one that draws upon an array of data resources that can be used individually or collectively, as appropriate, to set priorities for targeting one or a range of interventions VA might chose to support. Refining this approach will be completed early in the new Strategic Plan period.

Nevertheless, VA still has a need to target its resources for alleviating VAD, at a top level, by using an objective criterion to identify populations in experiencing VAD (e.g., to identify to whom and where it should allocate resources for programs intended to alleviate VAD). In such cases, the objective criterion is satisfied by examining VAD prevalence data supplied by UNICEF, or by examining the vitamin A deficiency component of the HHI score (which exhibit only a few disparities in rankings). Generally, these data sets suggest a need for VA to focus its work in Asia and Africa, although there remain smaller pockets of need in Latin America and the Caribbean. VA will continue to weight the

application of program resources in favor of Africa and Asia. Other factors will continue to play a role in decision-making (see next section below – “Administrative Priority Country Designations”) for a discussion of these factors. These factors will continue to reflect administrative/operational factors that influence whether and how VA can work in certain countries and manage VA supported activities.

As VA formulates and implements a more integrated and comprehensive set of program interventions intended to alleviate undernutrition characterized by both maternal and child multi-micronutrient deficiencies, new tools are needed to best identify target countries and within country risk groups. Under the Strategic Plan 2017 – 2019, VA will continue to explore new tools and the practical application of HHI as an alternative decision-making tool for targeting resources to address multi-micronutrient deficiencies. The HHI will be combined, necessarily, with other administrative/operational factors that influence whether and how VA can work in certain countries and manage VA supported activities.

» *VA’S USE OF “ADMINISTRATIVE PRIORITY COUNTRY” DESIGNATIONS.*

In the previous section (*TOOLS USED BY VA TO IDENTIFY/TARGET AT-RISK POPULATIONS BY THEIR NATIONAL/REGIONAL GEOGRAPHIC LOCATION*), we have noted the need for VA to move to adopt additional tools (i.e., data sets and indices) to help target programming resources in an objective way to identify at-risk populations and their location. In each of the attachments to this Strategic Plan, VA shows a commitment to adopt a range of objective criteria to identify to target populations. These include data sets and indices that rank or otherwise objectively reveal:

- Nations with moderate to severe rates of vitamin A deficiency as defined by UNICEF,
- Nations with moderate to high rates (and absolute numbers) of hidden hunger as described in the Hidden Hunger Index,
- Nations with moderate to severe burden of STH infections as defined by many specialized research groups and aggregated by WHO,
- Regional disparities in specific and/or general level of micronutrient deficiency, and
- Risk groups of the population that are at especially high risk of suffering adverse consequences of hidden hunger.

Each of these “screens” is or will be used by VA for targeting: to identify/define/locate risks groups, for setting priorities, and for the allocation of VA program resources – although there remains a need for VA to re-visit and update its overall approach to targeting given the expanded range of interventions VA now or will support. As noted above, however, subsequent to application of these evidence-based screens, additional screens need to be applied to allow VA to make decisions on targeting that reflect information pertaining to other administrative/operational factors that influence whether and how VA can work in certain countries.

To this end, VA’s past experience is important in making targeting decision, and that experience goes beyond published, objective national rankings. A revelation derived over years of experience from VA’s field operations is that local NGO health systems often have a special capacity to find and deliver services to “hard-to-reach” beneficiaries with whom VA seeks to connect with services. VA’s experience has been that “hard-to-reach” beneficiaries are often synonymous with individuals who are without access to national health services – with “access” being defined as geographical access, physical availability and/or financial access. It has also been VA’s experience that individuals who take advantage of services from local NGOs seek out these services precisely because national health services are unavailable or insufficient. Our experience also tells us that, irrespective of the availability of national health services and NGO health services, large pools of at-risk populations exist in most countries.

While NGO services may be services of a last resort, they have an advantage in that they are generally highly respected, locally, because they are responsive to local needs, are locally operated and locally financed. The capacity of Indigenous NGOs has traditionally emerged where national health services

are lacking. Based upon the known reach of vitamin A, it is apparent that national health services are able to reach, under optimal conditions, on average, about 70% of national populations, and this information probably gives a more optimistic appraisal of the reach of national health services. Nonetheless, if extrapolated beyond VAD to undernutrition associated with multi-micronutrient deficiency, vitamin A programming experience suggests that the last 20-30% of the most vulnerable go un-served unless they can access services from other health systems – of which those of the NGO sector are an important factor. Given that NGOs generally offer only a limited range of health services overall (and usually NGOs don't have the resources to purchase commodities for nutrition services, so they often don't offer these services), it means, especially vis-à-vis nutrition services, the most vulnerable in every country remain very vulnerable.

The strong capacity of indigenous NGOs to deliver services to reach, primarily, hard-to-reach populations are a phenomenon that exists globally. While NGOs do what they can, they generally do not have access to resources of national governments or to the resources of multi-lateral and bi-lateral institutions; and even if they did, bi-lateral and multi-lateral institutions generally allocate their scarce resources on the basis of the relative level of wealth of the nation in which the beneficiary lives, rather than identifying pockets of the population who are most vulnerable.

It is for all the reasons stated above that NGOs struggle to deliver a comprehensive range of health services. Indeed, most NGOs do not have the resources to establish comprehensive nutrition intervention services. Thus, VA has chosen to focus on finding, qualifying and partnering with local NGOs (where ever they exist) that are able to deliver health services to populations considered to be at-risk by virtue of indices that reflect known micronutrient deficiency.

VA's overarching approach, then, is to find indigenous NGOs that reach those who otherwise don't have access to nutrition services, to provide assistance to qualified partners that seek to add nutrition services or expand existing services, and that do not have effective access to governmental resources. Thus, VA works in any country where the beneficiaries for whom we support services generally have no or limited access to national health services.

In recent years, recognizing that VA has limited resources and large opportunities, VA decided to set priorities for allocation of resources. VA decided on two tactics: i) to passively fulfill requests that came from NGOs in virtually any "target" country to support specific interventions VA has a capacity to deliver as long as the country was listed as experiencing moderate or severe VAD; and ii) to develop a list of countries in which VA sought to focus its efforts because of the magnitude of the problem. The candidate countries identified for our focus were selected according to the following criteria or "screens":

- Nations classified by UNICEF as experiencing "severe" vitamin A deficiency or if needed, "moderate" vitamin A deficiency,
- Ranked among the 15 most populous nations by region, and
- Ranked among the 15 most populous nations with the largest under-5 population.

Using these criteria, VA identified the following nations as potential countries in which to focus:

TABLE 1. COUNTRIES WITH GREATEST NEED FOR VITAMIN A SUPPLEMENTATION

Region	Country	Number of Children 6-59 months of Age - Eligible for VAS (Millions)
Africa	DRC	2.4
	Ethiopia	3.5
	Nigeria	8.1
	South Africa	2.8
	Tanzania	2.5
	Uganda	2.2
	Sudan/South Sudan	1.9
Asia	Bangladesh	4.3
	India	40.7
	Indonesia	6.3
	Philippines	4.2
LAC	Brazil	4.4
	Mexico	3.3

Once these nations were identified, additional, administrative/operational screens were applied, including:

- Whether the national government permits importation of vitamin A capsules,
- Whether the country has an identifiable NGO sector delivering services, and was the NGO sector acknowledged by the national government as making a positive contribution to the alleviation of undernutrition,
- Whether NGO capacity existed to manage commodity importation processes, and
- Whether the country has reasonable political stability that could enable VA interventions.

Application of these criteria resulted in removal of some of these countries, including Pakistan (where the national government simply does not permit NGO importation of vitamin A or other nutritional supplements), Yemen (where political instability makes program activities nearly impossible), and Brazil (where the national government has excessive restrictions on work of foreign NGOs, including restrictions on the transfer of funds by foreign NGOs to national NGOs that makes short- and long-term support of programs very problematic). The following list of countries resulted:

TABLE 2. COUNTRIES WITH GREATEST NEED FOR VITAMIN A SUPPLEMENTATION AND WHERE NATIONAL CONDITIONS ALLOW VA TO OPERATE

Region	Country	Number of Children 6-59 months of Age - Eligible for VAS (Millions)
Africa	DRC	2.4
	Ethiopia	3.5
	Nigeria	8.1
	South Africa	2.8
	Tanzania	2.5
	Uganda	2.2

	Sudan/South Sudan	1.9
Asia	Bangladesh	4.3
	India	40.7
	Indonesia	6.3
	Philippines	4.2
LAC	Mexico	3.3

From among this list of countries, VA sought to understand the magnitude and nature of the opportunity in each country and the feasibility of operating a program from the U.S. – usually by engaging a local hire consultant to help formulate an approach for that country. Concurrently, VA proactively explored use of a local hire Country Program Advisor (not an employee, but a local hire consultant) to manage identification of partners and VA support to qualified NGOs in India and Nigeria. This was done to ascertain if the country program could be grown more effectively and efficiently with a local advisor as compared to a full time program manager based at VA headquarters. This experience revealed that having a local Country Program Advisor could dramatically accelerate the process of finding and vetting NGO field partners, and providing them with appropriate levels of technical assistance. This experience also revealed that certain countries in need and open to VA assistance provided directly to local NGOs also had ministries of health that sought for VA to have someone in-country continuously to respond to their questions or to actively coordinate with national bodies – even if VA was not registered as a local NGO. As a result, VA decided to expend limited resources over a 3-year period (coinciding with the last Strategic Plan 2014 – 2016) to support placement of a Country Program Advisor in 7 of these countries as show below:

TABLE 3. COUNTRIES WITH GREATEST NEED FOR VITAMIN A SUPPLEMENTATION, WHERE NATIONAL CONDITIONS ALLOW VA TO OPERATE, AND WHERE VA BELIEVES THE OPPORTUNITY IN TERMS OF NUMBERS OF BENEFICIARIES AVAILABLE JUSTIFY A VA COUNTRY PROGRAM ADVISOR FOR FY 2014 – 2016.

Region	Country	Number of Children 6-59 months of Age - Eligible for VAS (Millions)
Africa	DRC	2.4
	Nigeria	8.1
	Uganda	2.2
Asia	India	40.7
	Indonesia	6.3
	Philippines	4.2
LAC	Mexico	3.3

Each of these countries was eventually designated as “administrative priority countries” under the Strategic Plan 2014 – 2016. However, “administrative priority country” designation in this sense does not mean our support is focused only in those countries or that these countries have more “worthy” beneficiaries than those in other countries in which we support field partners. Rather it means:

- The country meets certain technical criteria of need to be listed on VA’s list of “target” countries as noted above as associated with Table 1,

- The country presents with special circumstances or requirements that affect VA's ability to support country activities, including:
 - Likely volume of potential NGO field partners,
 - Level of coordination sought by the national or local government among NGOs in country, and/or
 - Frequency and intensity with which the national government seeks direct communications with VA.
- The country program is deemed by VA headquarters (based in part upon the factors identified above) to be one in which, from a managerial perspective, local NGO partners could be more efficiently and effectively identified, vetted, and supported by recruiting a local hire "Country Program Advisor" as compared to other target countries where VA's headquarters staff could undertake the same function more efficiently and effectively.

In effect an administrative priority country is a "target" country that requires the presence of a Country Program Advisor. Importantly, among the nations listed in Table 2 above – which is most representative of the countries with the largest need, VA has field partners in all. It is important to re-emphasized that not every country deemed by VA to be among those "targeted" for support is an "Administrative Priority Country", but that every administrative priority country is a target country. Put another way, an administrative priority country is one for which operations can be facilitated more efficiently and effectively by a Country Program Advisor. However, VA operates through field partners in roughly 50+ "target" countries each year where at-risk populations are identified and whom we believe can be reached by NGO field partners.

As VA moves into the Strategic Plan 2017 – 2019, it will continue to operate large programs through field partners in 50+ target countries based upon a range of technical factors pertaining to the presence of VAD and/or maternal and child micronutrient deficiencies or hidden hunger; and it will position a Country Program Advisor in those countries it deems useful to coordinate or facilitate its programming. However, VA will also periodically re-assess the nature and application of "screens" used to determine where *hidden hunger* is most severe as compared to where vitamin A deficiency is most severe. In this regard, during this new Strategic Plan period, VA will move away from near exclusive reliance on VAD data from UNICEF to identify target countries, to use of the Hidden Hunger Index as an additional tool (along with other relevant country ranking data) for ascertaining and prioritizing nations where VA intervention may have a beneficial effect¹⁰. The overall approach for managing VA's use of tools to make targeting decision is one in progress – making this transition to an operationally useful set of rules to be applied is still under consideration but will be adopted early in the Strategic Plan period.

¹⁰ VA uses rankings of countries developed by WHO to determine which countries are endemic for soil transmitted helminthes (STH) and thereby to target VA support. VA will supplement its use of WHO data by continuing to use maps generated by a number of agencies, and aggregated by Children Without Worms, to help form a more up-to-date and granular picture of sub-national distribution of STH in selected nations – to improve targeting of VA support for deworming.