

Chapter Seven

How to Improve Nutrition via Effective Programming



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“What we think or what we know or what we believe is, in the end, of little consequence. The only consequence is what we do.”

John Ruskin, English artist, art critic and philosopher (1819–1900)

John Ruskin

<http://www.chrisliff.co.uk/blog/?p=807>

Key messages

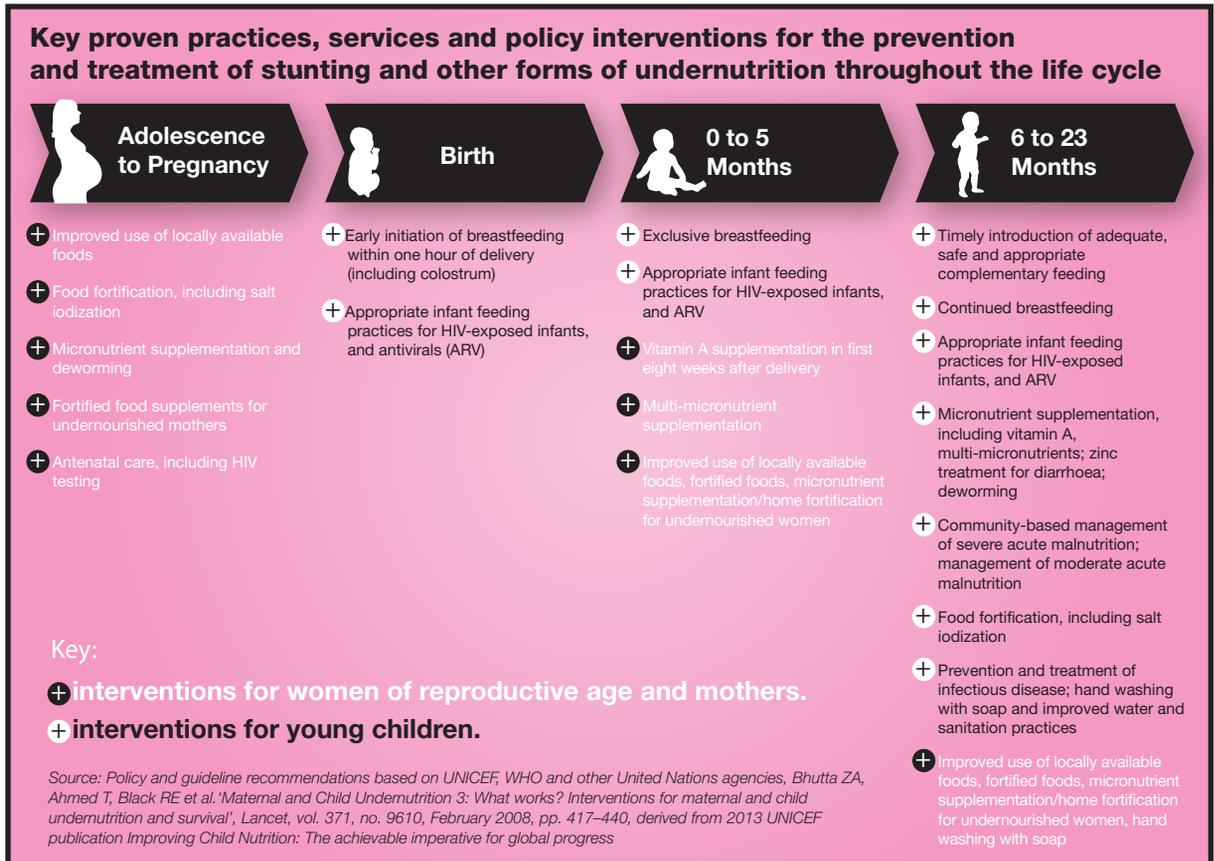
- Reductions in stunting and other forms of undernutrition can be achieved through proven interventions. These include improving women’s nutrition, especially before, during and after pregnancy; early and exclusive breastfeeding; timely, safe, appropriate and high-quality complementary food; and appropriate micronutrient interventions.
- Timing is important – interventions should focus on the critical 1,000-day window including pregnancy and before a child turns two. After that window closes, disproportionate weight gain may increase the child’s risk of becoming overweight and developing health problems such as non-communicable diseases in adult life.
- Efforts to scale up nutrition programs are working, benefiting women and children and their communities in many countries. Such programs all have common elements: political commitment, national policies and programs based on sound evidence and analysis, the presence of trained and skilled community workers collaborating with communities, effective communication and advocacy, and multi-sectoral, integrated service delivery.

UNICEF’s 2009 report *Tracking Progress on Child and Maternal Nutrition* drew attention to the impact of high levels of undernutrition on child survival, growth and development and their social and economic toll on nations. It described the state of nutrition programs worldwide and argued for improving and expanding delivery of key nutrition interventions during the critical 1,000-day window covering a woman’s pregnancy and the first two years of her child’s life, when rapid physical and mental development occurs. This chapter builds on those earlier findings by highlighting new developments and demonstrating that efforts to scale up nutrition programs are working, benefiting children in many countries. It is based on the 2013 UNICEF publication *Improving Child Nutrition: The achievable imperative for global progress*.

Nutrition-specific interventions

Nutrition-specific interventions are actions that have a direct impact on the prevention and treatment of undernutrition, in particular during the 1,000 days covering pregnancy and the child’s first two years. These interventions should be complemented by broader, nutrition-sensitive approaches that have an indirect impact on nutrition status. Equity considerations in nutrition programming are particularly important, as stunting and other forms of undernutrition usually afflict the most vulnerable populations.

Promoting optimal nutrition practices, meeting micronutrient requirements and preventing and treating severe acute malnutrition are key goals for nutrition programming. The 2009 *Tracking Progress on Child and Maternal Nutrition* report summarized the evidence base for nutrition-specific interventions.



Taking a life-cycle approach, the activities fall broadly into the following categories:

- Maternal nutrition and prevention of low birth weight
- Infant and young child nutrition (IYCN)
 - Breastfeeding, with early initiation (within one hour of birth) and continued exclusive breastfeeding for the first six months followed by continued breastfeeding up to 2 years
 - Safe, timely, adequate and appropriate complementary feeding from 6 months onwards
- Prevention and treatment of micronutrient deficiencies
- Prevention and treatment of severe acute malnutrition
- Promotion of good sanitation practices and access to clean drinking water
- Promotion of healthy practices and appropriate use of health services

Maternal nutrition

Nutritional status before and during pregnancy influences maternal and child health. Optimal child development requires adequate nutrient intake, provision of supplements as needed, and prevention of disease. It also requires protection from stress factors such as cigarette smoke, narcotic substances, environmental pollutants and psychological stress. Maternal malnutrition leads to poor fetal growth and low birth weight.

Interventions to improve maternal nutrient intake include supplementation with iron, folic acid, iodine, or multiple micronutrients and provision of food and other supplements where necessary. Compared to iron-folic acid supplementation alone, supplementation with multiple micronutrients during pregnancy has been found to reduce low birth weight by about 10 percent in low-income countries. Adequate intake of folic acid and iodine around conception and of iron and iodine during pregnancy are important, especially for development of the infant's brain.

Among undernourished women, balanced protein-energy supplementation has been found effective in reducing the prevalence of low birth weight. The use of lipid-based supplements for pregnant women in emergency settings is being studied as a way to improve child growth and development.

Many interventions to promote maternal health and fetal growth are delivered by the health system and through community-based programs. Antenatal care visits should be used to promote optimal nutrition and deliver specific interventions, such as malaria prophylaxis and treatment and deworming. Community-based education and communication programs can encourage appropriate behaviors to improve nutrition.

Beyond such specific interventions, other relevant interventions include preventing pregnancy during adolescence, delaying age of marriage, preventing unwanted or unplanned pregnancy, increased birth spacing and overcoming sociocultural barriers to healthy practices and healthcare-seeking.

Early initiation of breastfeeding

Several studies have demonstrated that early initiation of breastfeeding reduces the risk of neonatal mortality. Colostrum, the rich milk produced by the mother during the first few days after delivery, provides essential nutrients as well as antibodies to boost the baby’s immune system, thus reducing the likelihood of death in the neonatal period. Beyond saving lives, early initiation of breastfeeding promotes stronger uterine contractions, reducing the likelihood of uterine bleeding. It also reduces the risk of hypothermia, improves bonding between mother and child and promotes early milk production.

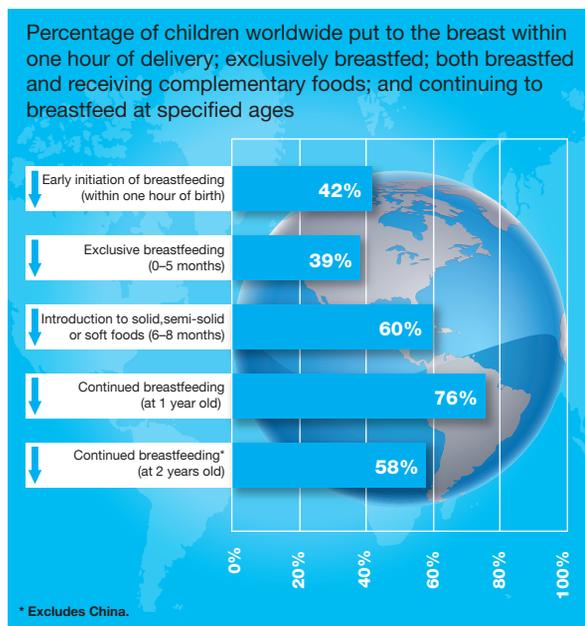
Fewer than half of newborns globally are put to the breast within the first hour of birth, though early initiation of breastfeeding is higher in least-developed countries (52 percent in 2011).

Exclusive breastfeeding

Exclusive breastfeeding in the first six months of life saves lives. During this period, an infant who is not breastfed is more than 14 times more likely to die from all causes than an exclusively breastfed infant. Infants who are exclusively breastfed are less likely to die from diarrhea and pneumonia, the two leading killers of children under 5. Moreover, many other benefits are associated with exclusive breastfeeding for both mother and infant, including prevention of growth faltering.

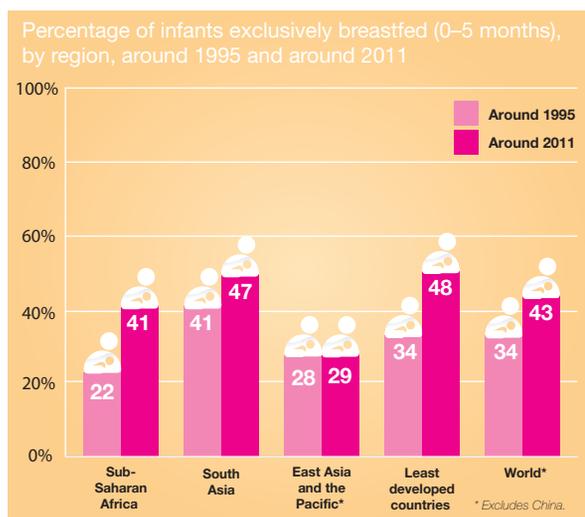
Globally 39 percent of infants less than 6 months of age were exclusively breastfed in 2011 (Figure 20 ##in original – please renumber for this publication##). Some 76 percent of infants continued to be breastfed at 1 year of age, while only 58 percent continued through the recommended

Globally, less than 40 per cent of infants are exclusively breastfed



UNICEF Global Nutrition Database, 2012, based on MICS, DHS and other national surveys, 2007–2011.

Most regions have increased rates of exclusive breastfeeding



Note: Estimates based on a subset of 50 countries with available trend data. Regional estimates are presented only where adequate population coverage is met. Rates around 2011 may differ from current rates, as trend analysis is based on a subset of countries.

UNICEF Global Nutrition Database, 2012, based on MICS, DHS and other national surveys.

duration of up to two years. The regions with the highest exclusive breastfeeding rates of infants under 6 months old were Eastern and Southern Africa (52 percent) and South Asia (47 percent), with similar rates in least-developed countries as a whole. However, coverage is lowest in sub-Saharan Africa, with 37 percent of infants less than 6 months of age exclusively breastfed in 2011. This is due largely to the low rate in West and Central Africa (25 percent) compared to Eastern and Southern Africa (52 percent).

Complementary feeding

Studies have shown that feeding with appropriate, adequate and safe complementary foods from the age of 6 months onwards leads to better health and growth of children. Breast milk remains an important source of nutrients, and it is recommended that breastfeeding continue until children reach 2 years of age. In vulnerable populations especially, good complementary feeding practices have been shown to reduce stunting markedly and rapidly.

Key principles guide programming for complementary feeding. They include education to improve caregiver practices; increasing energy density and/ or nutrient bioavailability of

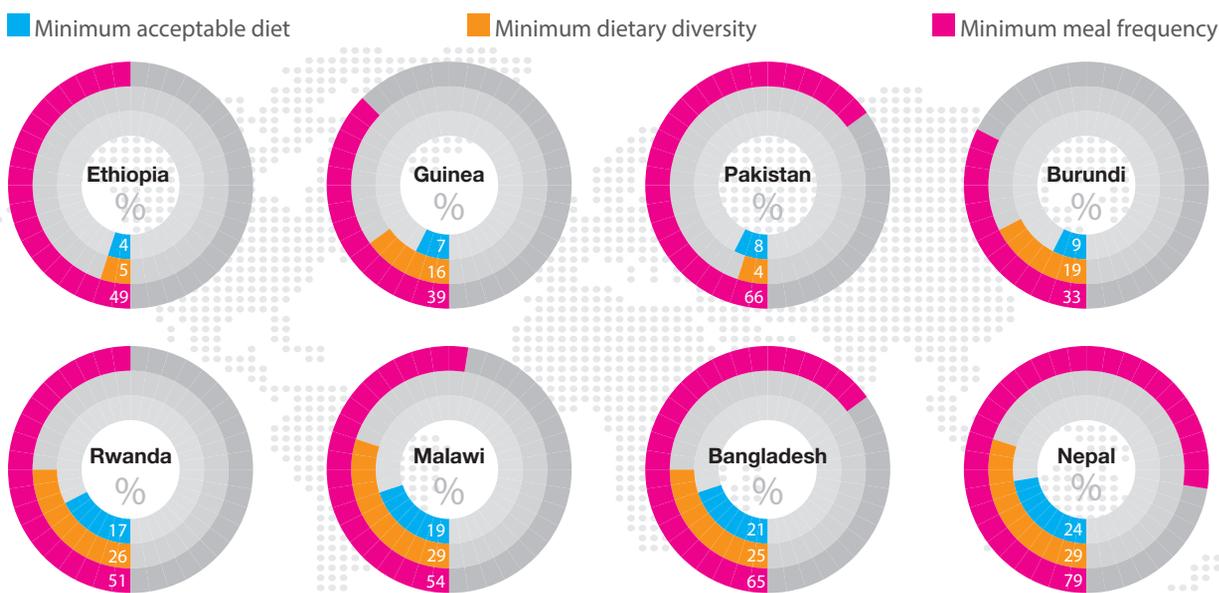
Rates of exclusive breastfeeding have increased by more than 20 percent, from 34 percent around 1995 to 43 percent around 2011. It is particularly encouraging to note the nearly 50 percent increase in exclusive breastfeeding rates in sub-Saharan Africa, from 22 percent to 41 percent during this period. Progress has also been made in least developed countries, where exclusive breastfeeding rates increased by nearly one third, from 34 percent to 48 percent.

complementary foods; providing complementary foods, with or without added micronutrients; and fortifying complementary foods, either centrally or through home fortification including use of multiple micronutrient powder (MNP), in each case paying greater attention to food-insecure populations.

Globally, only 60 percent of children aged 6 to 8 months receive solid, semi-solid or soft foods, highlighting deficiencies in the timely introduction of complementary foods. Of the 24 countries profiled in this report, only 8 had recent data reflecting both the frequency and quality of complementary feeding for children aged 6 to 23 months.

Complementary feeding in eight countries

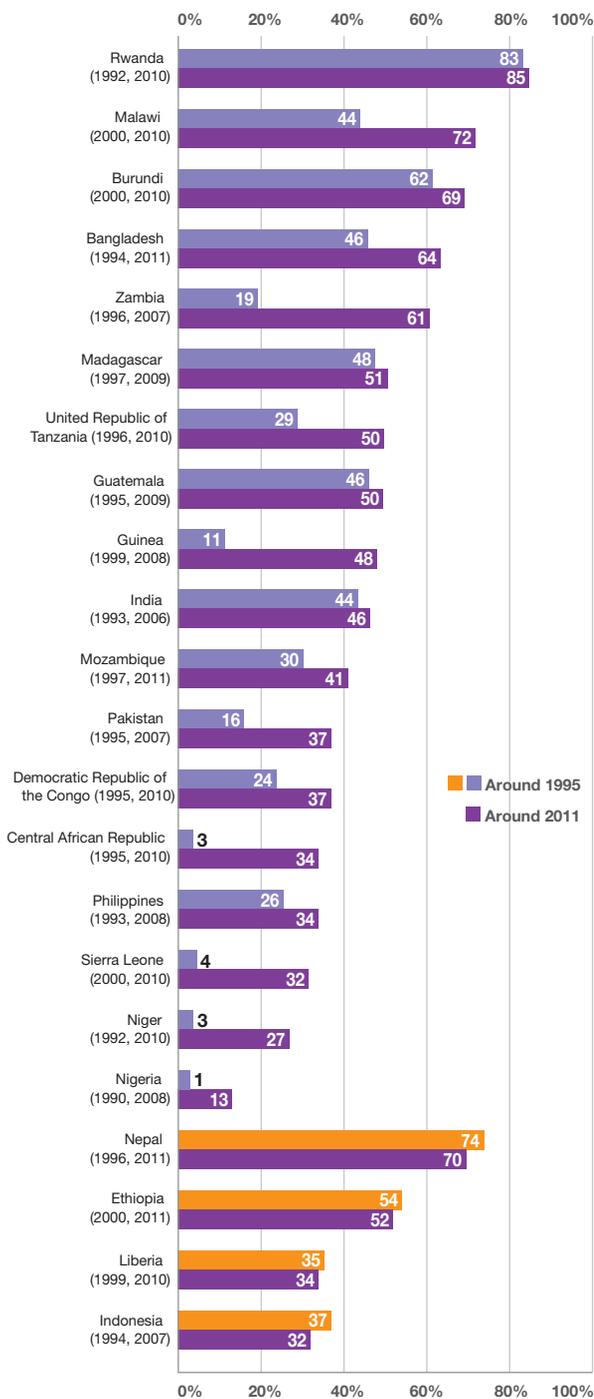
Percentage of breastfed and non-breastfed children aged 6–23 months receiving minimum acceptable diet, minimum dietary diversity, and minimum meal frequency



Note: The eight countries selected were those profiled in this report with available data on complementary feeding indicators. Minimum meal frequency refers to the percentage of children aged 6–23 months who received solid, semi-solid or soft foods the minimum number of times or more (for breastfed children, minimum is defined as two times for infants 6–8 months and three times for children 9–23 months; for non-breastfed children, minimum is defined as four times for children 6–23 months); minimum dietary diversity refers to the percentage of children aged 6–23 months who received foods from four or more food groups; and minimum acceptable diet refers to the percentage of children aged 6–23 months who received a minimum acceptable diet both in terms of frequency and quality, apart from breastmilk.

Many countries have increased rates of exclusive breastfeeding

Percentage of infants exclusively breastfed (0–5 months), by country, around 1995 and around 2011



UNICEF Global Nutrition Database, 2012, based on MICS, DHS and other national surveys

Infant and Young Child Nutrition (IYCN)

Optimal IYCN practices include initiating breastfeeding within one hour of birth, exclusive breastfeeding for the first six months of life and continued breastfeeding up to the age of 2 and beyond, together with safe, age-appropriate feeding of solid, semi-solid and soft food starting at 6 months of age.

Two practices together – ensuring optimal breastfeeding in the first year and complementary feeding practices – could prevent almost one fifth of deaths of children under 5 years of age. Studies suggest that optimal breastfeeding improves brain development. Breastfeeding may also protect against cardiovascular risk factors, although it is not yet clear whether this is the case in low- and middle-income settings.

Nutrition programming in this area continues to receive insufficient attention, despite the well-established benefits of age-appropriate IYCN practices. Valuable lessons from programming experiences have led to changes to IYCN strategies. A comprehensive, multi-pronged approach is needed, with both cross-cutting and targeted strategies at community, health system and national levels.

Key components and interventions of an infant and young child feeding strategy



Adapted from Programming Guide: Infant and young child feeding, UNICEF, 2011.

Continuing the Discussion on Adequate Nutrient Intakes for Infancy

The following letter by Zulfiqar Ahmed Bhutta, which appeared in Sight and Life magazine, Vol. 27 (1) 2013, is a response to David Thurnham's article on "Adequate Nutrient Intakes for Infancy, Part 1: From 0 to 6 Months," published in Sight and Life magazine, Vol. 26 (3) 2012 [Ed.]

The article by Thurnham¹ in *Sight and Life* 3/2012 reviews the evidence around breast milk volumes, nutrient composition and recommendations for infants under six months of age. The review covers a vast landscape and summarizes pertinent information as to volume, energy and micronutrient needs, and adequacy of intake through breastfeeding and breast milk. In addition to useful information on milk volumes and energy, an important conclusion made by the authors is the identification of Group 2 nutrients whose concentrations are unaffected by maternal intake, and can lead to maternal depletion. This is a key step in addressing the adequacy of intake in the first six months of life.

The review highlights two areas that merit further work. Firstly, there exists a real need to develop sensitive and reliable methods for estimating breast milk intake in a range of settings. The continued reliance on test-weighing and the variability in measurements in ambulatory settings makes this a less-than-optimal method for assessing breast milk volume. Although there are established stable isotope techniques for measuring breast milk intake^{2,3} these are onerous and not widely available. Secondly, information on breast milk intake and quality in malnourished populations is also outdated, and few studies have been conducted in populations with high rates of HIV infection or among wasted women with a body mass index <18.5. While studies do suggest that the volume of breast milk produced may not be affected during acute infection, milk composition is known to change during this state.⁴ Although the effects of marginal maternal malnutrition on breast milk composition and quality are well-recognized,⁵ these effects may be exaggerated among populations with more severe forms of maternal wasting and concomitant infections such as HIV.

Investments must be made in optimizing the health and nutrition of mothers

As underscored by Thurnham et al,¹ the onset of linear growth failure among young infants varies in different populations. While the onset of stunting may accompany the introduction of complementary foods after 4–6 months, and coincidental infections,⁶ in many regions the onset of linear growth retardation may occur earlier⁷ and reflect the impact of maternal health factors and micronutrient

deficiencies. The implications of these findings and the limitations of addressing key micronutrient deficiencies sufficiently through maternal supplementation during lactation suggest the need for intervening early during pregnancy or the pre-pregnancy period. In many populations with high rates of maternal micronutrient deficiencies and malnutrition, most women present for antenatal care well into the second trimester, and replenishing deficits in this limited time window of pregnancy may not be possible.⁸ In such circumstances, reaching adolescent girls and women in the pre-pregnancy period, along with adequate birth-preparedness and nutrition support, is critical in addressing key micronutrient deficits during pregnancy and early infancy. With the increased emphasis on lactation support and counseling for breastfeeding, comparable investments must be made in optimizing the health and nutrition of mothers prior to, and during, pregnancy.

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Prevention and treatment of micronutrient deficiencies

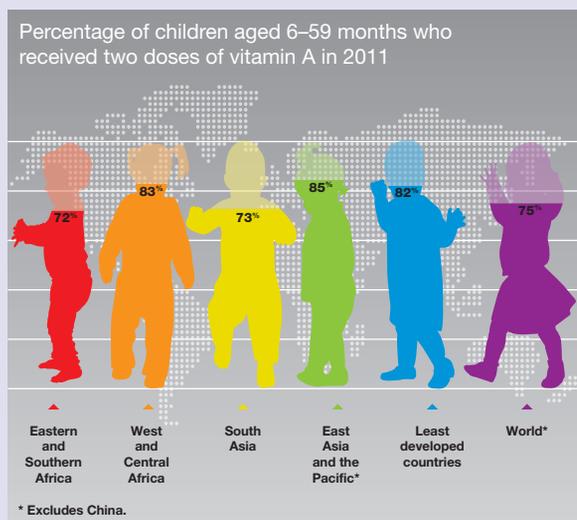
Micronutrient deficiencies, including deficiencies of vitamin A, iron, iodine, zinc and folic acid, are common among women and children in low- and middle-income countries. Ensuring adequate micronutrient status in women of reproductive age, pregnant women and children improves the health of expectant mothers, the growth and development of unborn children, and the survival and physical and mental development of children up to 5 years old.

Programs to address micronutrient deficiencies include delivery of supplements to specific vulnerable groups, home fortification of complementary food for children aged 6 to 23 months and fortification of staple foods and condiments.

Vitamin A supplementation

Globally, one in three preschool-aged children and one in six pregnant women are deficient in vitamin A due to inadequate dietary intake (1995–2005, WHO: http://whqlibdoc.who.int/publications/2009/9789241598019_eng.pdf). The highest prevalence remains in Africa and South-East Asia. Vitamin A is necessary to support immune system response, and children who are deficient face a higher risk of dying from infectious diseases such as measles and diarrhea. Vitamin A supplementation delivered periodically to children aged 6 to 59 months has been shown to be highly effective in reducing mortality (on average -24 percent) from all causes in countries where vitamin A deficiency is a public health problem.

Vitamin A supplementation reaches more than 80 per cent of young children in least developed countries



Globally, three in four children (75 percent) aged 6 to 59 months received two doses of vitamin A in 2011, sufficient to reduce under-five child mortality. Coverage of vitamin A supplementation was highest in East Asia and the Pacific (85 percent; excluding China for lack of data) and West and Central Africa (83 percent). Nearly half of countries reporting these data in 2011 did not reach the 80 percent coverage target.

Iron supplementation

Iron deficiency predominantly affects children, adolescent girls and menstruating and pregnant women. Globally, the most significant contributor to the onset of anemia is iron deficiency. Consequences of iron deficiency include reduced school performance in children and decreased work productivity in adults. Anemia is most prevalent in Africa and Asia, especially among poor populations. Global estimates from the WHO database suggest that about 42 percent of pregnant women and 47 percent of preschool-aged children suffer from anemia.

Universal salt iodization

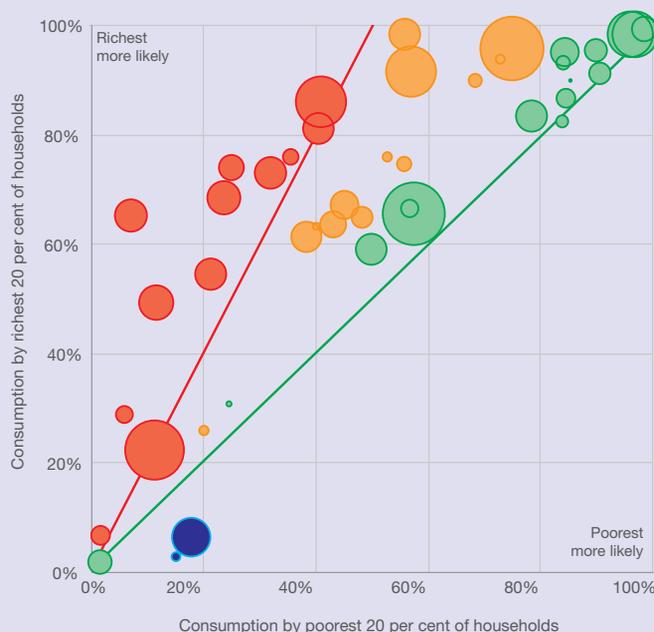
Iodine deficiency is the most common cause of preventable mental impairment. Fortification of salt is widely used to avert consequences associated with this deficiency. Significant progress has been made in reducing the number of countries whose populations suffer mild to severe iodine deficiency, from 54 countries in 2003 to 32 in 2011. During this period the number of countries reaching adequate iodine intake increased by more than one third, from 43 to 69.

Globally, 75 percent of households have adequately iodized salt (15 parts per million or more), but coverage varies considerably by region. East Asia and the Pacific had the highest coverage, 87 percent in 2011, and as a region had nearly reached the universal salt iodization target of 90 percent. Coverage was lowest in sub-Saharan Africa, where less than half of households have adequately iodized salt. Coverage is generally higher among richer households than poorer households.

One fifth of countries reporting in 2011 had reached the 90 percent target of universal salt iodization. Most had reached only 50 to 70 percent coverage. Support of national salt iodization programs is needed, along with advocacy to increase awareness among country policy-makers about the need to eliminate iodine deficiency, private-public partnerships to assist salt producers with sustained iodization, and education of civil society to build demand for iodized salt.

Iodized salt consumption is more likely among the richest households than the poorest households

Consumption of adequately iodized salt among the richest households compared to the poorest, in countries with available data



- Richest 20% more than twice as likely as poorest 20% (12 countries)
- Richest 20% more likely than poorest 20% (13 countries)
- Richest 20% equally as likely as poorest 20% (16 countries)
- Richest 20% less likely than poorest 20% (2 countries)

How to read this graph:

Each circle represents data from one country. The size of a circle is proportional to the size of the country's population. The horizontal axis represents the percentage of the poorest 20 per cent of households consuming adequately iodized salt, while the vertical axis represents the percentage of the richest 20 per cent of households. Circles along the green line represent countries in which the likelihood of consuming adequately iodized salt is similar among the richest and the poorest households. Circles above or below the green line suggest disparity. The closeness of circles to the upper-left corner indicates greater advantage for the richest households in that country (greater disadvantage for the poorest households).

Note: Based on 43 countries with available disparity data.

Source: UNICEF Global Nutrition Database, 2012, MICS, DHS and other national surveys, with additional analysis by UNICEF, 2006–2011, derived from 2013 UNICEF publication *Improving Child Nutrition: The achievable imperative for global progress*.

Fortification of complementary foods, staple foods and condiments

Home fortification

Multiple micronutrient powders (MNPs) offer a low-cost, highly acceptable way to improve the quality of complementary foods. MNPs have been found highly effective in preventing iron deficiency and iron-deficiency anemia. Combined with additional supplementary energy, protein and fats, MNPs have also been shown to improve child growth and development.

Based on a global assessment carried out in 2011, some 22 countries, mostly in Asia and Latin America and the Caribbean, were implementing MNP interventions to improve the quality of complementary food. They reached over 12 million children in 2010, mainly by distributing MNPs through the public health system. Four countries are implementing national-scale programs and 17 countries are working to scale up to a national level. Further expansion is taking place, mainly in Africa and South-East Asia.

Large-scale fortification

Adding micronutrients to staple foods such as wheat and maize flour, cooking oil, sugar, salt, complementary foods and condiments in factories and other production sites is a cost-effective way to improve the micronutrient status of populations. For example, flour is commonly fortified with iron, zinc, folic acid and other B vitamins such as thiamin, riboflavin, niacin, vitamin B12 and vitamin A in some countries. As of December 2012, wheat flour fortification is mandated by law in 75 countries compared with only 33 countries in 2004. The amount of flour currently fortified represents about 30 percent of the global production of wheat flour from industrial mills.

Scaling up nutrition

Kenya continues to shine in addressing malnutrition, a public health problem that also hinders economic development in many developing countries. This week [in November 2012], leaders, professionals, private sector representatives and other partners gathered in Nairobi for a high-level symposium on Scaling Up Nutrition (SUN).

Kenya is one of 31 countries to join the Movement to date. The SUN event comes on the heels of the launch of an exciting public-private partnership, expected to reach 27 million Kenyans with a range of foods fortified with essential vitamins and minerals (micronutrients).

Children who are well-nourished – especially in the 1,000 days between pregnancy and the second birthday – grow up to learn more, earn more and stay healthy. But those who are malnourished suffer irreversible and lifelong damage, including stunted growth and impaired cognitive development.

Based on this evidence, SUN partners focus on implementing solutions that improve nutrition, including support for breastfeeding and ensuring access to essential vitamins and minerals through supplementation, micronutrient powders and food fortification. Countries working to scale up nutrition have established targets tailored to address their own specific challenges and capitalize on their greatest opportunities for lasting impact.

In Kenya, 35 percent of children under five are stunted and over 10 million people suffer from poor nutrition and chronic food insecurity.



Lost productivity

Micronutrient deficiencies are widespread, leading to health problems including blindness, lost productivity, pregnancy complications and increased risk of death from diseases like measles and diarrhea. The Government of Kenya has developed a comprehensive National Food Security and Nutrition Policy and Strategy that recognizes the need for multi-public and private-sector involvement in addressing malnutrition.

They also have a long history of supporting food fortification. The fortification of common foods is a proven, cost-effective way to improve the health and productivity of whole populations. The fortification of commercially produced staple foods continuously delivers nutrients to large segments of the population, without requiring that they change their eating habits.

The impact is huge. Take the case of fortified flour, now required by 57 countries. Fortifying flour with folic acid has reduced cases of brain and spine birth defects (also known as neural tube defects) by up to 70 percent.

The return on investment from micronutrient provision, including food fortification, is astounding. According to the 2012 Copenhagen Consensus panel of experts, every \$1 spent providing essential micronutrients to preschoolers generates \$30 in benefits. Just last month, the Kenya National Food Fortification Alliance launched the national fortification logo *kuboresha afya* (improving health), marking for Kenyan consumers the range of foods now fortified with vital micronutrients.

If we are going to improve global health and development, we need to scale up nutrition. Proven, high-impact, low-cost interventions like food fortification exist. We need more public-private partnerships to implement these interventions. We need more countries like Kenya to join the SUN, to both share what they have learnt and to learn from other Movement members. Because we can do far more by working together than any one of us could do alone.

Klaus Kraemer and Gladys Mugambi, www.africareview.com, 9 November 2012 (abridged)

Source: Dr Klaus Kraemer is the Director of Sight and Life, a non-profit humanitarian nutrition think tank of DSM, which cares about the world's most vulnerable populations and exists to help improve their nutritional status.

Gladys Mugambi is Kenya's deputy head of the Division of Nutrition, Food Fortification Project Manager for the Ministry of Public Health and Sanitation, and Secretary of the Kenya National Food Fortification Alliance.

Community-based interventions

Children with severe acute malnutrition (SAM) are nine times more likely to die than children who are well-nourished. Children who are wasted, have highly variable weight-for-height or experience negative changes in weight-for-height, are at a higher risk for linear growth retardation and stunting.

While prevention is the first step towards management of SAM, once it occurs, urgent action is needed to minimize complications and avoid the risk of death. It is increasingly recognized that SAM is a problem not only in emergency contexts but also in non-emergency settings.

Community-based management of acute malnutrition (CMAM) has proven to be successful in treating acute malnutrition and was officially endorsed by the United Nations in 2007. It decentralizes the management of SAM, making it easier to reach and treat children in their communities. It involves early detection of children with SAM with treatment in the community, timely referral to inpatient care for those who need it and subsequent follow-up in the community. Multiple partners have supported this approach in both emergency and non-emergency settings by guiding policy change, providing technical support and making commitments to provide therapeutic supplies. Using this approach, more than 75 percent of treated children are expected to recover. In addition, more children have access to treatment because hospitalization is not required for the majority of cases.

Five countries account for more than half of admissions for treatment of severe acute malnutrition

Number of reported cases admitted for treatment of SAM in 2011

	Ethiopia	302,000
	Niger	299,000
	Somalia	167,000
	Pakistan	157,000
	Democratic Republic of the Congo	157,000
Total		1,082,000

Note: Figures are presented to the nearest 1,000. There is no standardized system of national reporting, therefore the mode of each country's data collection differs (whether based on health facilities with functional services for SAM or numbers of implementing partners submitting reports). Also note that while Niger, Somalia and Pakistan received 100 per cent of expected reports for 2011, Ethiopia and the Democratic Republic of the Congo indicated receiving 80 per cent of expected reports.

Source: UNICEF Global Nutrition Database, based on Global SAM Update, 2012.

Globally in 2011, an estimated 2 million children under 5 were admitted for treatment of SAM – compared with just over 1 million reported during 2009. This increase in reported admissions is not only indicative of improved access to SAM management, but also reflects improved national reporting.

Key strategies to expand access to quality treatment of SAM include creating national policies to help governments accelerate and sustain scale-up, building national capacities and strengthening systems to support CMAM scale-up, and integrating CMAM into other health and nutrition activities.

Water, sanitation and hygiene and access to health services

Repeated episodes of diarrhea, intestinal infestation with nematode worms and possibly tropical or environmental enteropathy (in which fecal contamination causes changes to the intestines affecting permeability and absorption) can impede nutrient absorption and diminish appetite, resulting in stunting and other forms of undernutrition.

Improving water, sanitation and hygiene as well as housing and access to and use of health services can promote healthy environments and reduce the prevalence of infectious diseases, and key interventions implemented at scale can reduce undernutrition. These include immunization, improving sanitation by creating environments free of open defecation, hand washing with soap, access to clean drinking water, use of oral rehydration salts and therapeutic zinc to treat diarrhea, prevention (with insecticide-treated mosquito nets) and treatment of malaria, and treatment of pneumonia with antibiotics. Ongoing research is needed to help quantify the effect and the effectiveness of interventions in different settings.

Community-based approaches

Scale-up of integrated, community-based nutrition programs linked with health, water and sanitation, and other relevant interventions is a priority strategy that can bring measurable improvements in children's nutritional status, survival and development. Community support can include providing services such as counseling, support and communication on IYCN; screening for acute malnutrition and follow-up of malnourished children; deworming; and delivering vitamin A and micronutrient supplements. Synergizing nutrition-specific interventions with other early child development interventions at the community level is also important for holistically promoting early child development and reducing inequalities.

Communication for behavior and social change

Based on formative research on the barriers to and the facilitators of good nutrition, communication for behavior and social change can promote behavior change in communities, raise awareness about nutrition services and stimulate shifts in social norms in order to improve the enabling environment for good nutrition in communities.

Maintaining the focus on equity

Maintaining a focus on equity is particularly important, because stunting and other forms of undernutrition are concentrated among the most disadvantaged in society.

Undernutrition is inextricably linked with poverty. Equity-focused nutrition programming and other development strategies can effectively address the inequalities caused by poverty and the forms of exclusion that exist among groups and individuals.

For biological reasons, women and children are more vulnerable to nutritional deficiencies; special efforts are therefore needed to address the biological and social inequities that affect them. Women's low education levels, unequal social status and limited decision-making power can negatively influence the nutrition status of their children, as well as their own. Improving access to education and creating opportunities for both girls and boys, and their families, will confer many benefits in terms of nutritional status and child development.

Creating an enabling environment that targets the needs of vulnerable people is crucial. Since inequalities in nutritional status have a long-lasting, intergenerational impact on a country's physical, social and economic well-being, the response by communities and governments has implications for the nation's pursuit of equitable development.

The way forward

Over the past few years, national and global interest in nutrition has increased dramatically. There are a number of reasons for this new interest.

Recurrent food shortages, rising food prices and humanitarian crises in some regions have garnered global attention. The debate on climate change and the focus on building resilience in communities under stress have also focused attention on nutrition. At the other end of the spectrum, the rising numbers of people who struggle with overweight and obesity have become more glaring.

More persuasive evidence has become available on the harmful consequences of micronutrient deficiencies and the positive impact of exclusive breastfeeding and adequate complementary feeding for adult life and the next generation. At the same time, evidence has improved on the effectiveness of program approaches to treat conditions such as severe acute malnutrition using ready-to-use therapeutic foods and iron and folic acid deficiency using supplementation and wheat flour fortification – as well as on the feasibility of implementing these programs at scale.

Scientific knowledge and understanding have also improved regarding the linkages between stunting and rapid and disproportionate weight gain in early childhood. This has resulted in a shift in response. Previously the focus was on efforts to reduce the prevalence of underweight among children under the age of 5, an indicator of MDG 1. Now it is shifting towards prevention of stunting during the period from pregnancy up to 2 years of age.

The improved scientific evidence on the impact of interventions has enhanced advocacy to position nutrition as a sound investment for poverty reduction and social and economic development.

A unified international nutrition community has been using the Scaling Up Nutrition (SUN) Movement to successfully advocate for reduction of stunting, acute malnutrition and micronutrient deficiencies. This message has been heard and echoed by other initiatives and channels, including the Secretary-General's Zero Hunger Challenge, the 1,000 Days initiative and the Copenhagen Consensus 2012 Expert Panel's findings that malnourishment should be the top priority for policy-makers and philanthropists. The G8 has also included action to address stunting and other forms of undernutrition in its agenda.

By mid-2013, the SUN message had led 40 countries in Africa, Asia and Latin America to scale up their nutrition programs, supported by a wide range of organizations and, in many cases, by the donor community. This is probably the clearest indication of the growing interest in tackling stunting and other forms of undernutrition. It is crucial to maintain this momentum and to further increase the level of interest and motivation.

Nutrition-sensitive approaches

Nutrition-sensitive approaches involve other sectors in indirectly addressing the underlying causes of undernutrition. There is less evidence for the impact of nutrition-sensitive approaches than for direct nutrition-specific interventions, in part because they are hard to measure. However, policies and programming in agriculture, education, social protection and poverty reduction are important for realizing nutrition goals. Achieving nutrition-sensitive development requires multi-sectoral coordination and cooperation with many stakeholders, which has historically been challenging in nutrition. Agriculture and social protection programs are discussed in more detail below.

Agriculture

Recently, attention has increasingly been paid to improving synergies and linkages between agriculture and nutrition and health, in both the programmatic and the research communities.

The global agricultural system is currently producing enough food to feed the world, but access to adequate, affordable, nutritious food is more challenging. Improving dietary diversity by increasing production of nutritious foods is achievable, particularly in rural populations. It is done by producing nutrient-dense foods, such as fruits and vegetables, fish, livestock, milk and eggs; increasing the nutritional content of foods through crop biofortification and post-harvest fortification; improving storage and preservation of foods to cover 'lean' seasons; and educating people about nutrition and diet. In several settings these types of interventions have been shown to improve dietary patterns and intake of specific micronutrients, either directly or by increasing household income. However, the impact on stunting, wasting and micronutrient deficiencies is less clear.

More effort is needed to align the pursuit of food security with nutrition security and improved nutritional outcomes.

Social protection

Social protection involves policies and programs that protect people against vulnerability, mitigate the impacts of shocks, improve resilience and support people whose livelihoods are at risk. Safety nets are a type of social protection that provides or substitutes for income: Targeted cash transfers and food-access-based approaches are the two main categories of safety nets intended to avert starvation and reduce undernutrition among the most vulnerable populations. Food-based safety nets are designed to ensure livelihoods (such as public works employment paid in food), increase purchasing power (through food stamps, coupons or vouchers) and relieve deprivation (by providing food directly to households or individuals).

While social safety net programs operate in at least a dozen countries, evidence indicating that these programs have improved child nutritional status is still limited. A review of evaluations of conditional cash transfer programs showed an impact on stunting in two of five studies, the *Familias en Acción* program in Colombia and the *Oportunidades* program in Mexico. Of the three unconditional cash transfer programs, two (South African Child Support Grants and Ecuador's *Bono Solidario*) reduced stunting. More research and evidence is needed on the long-term outcomes of these programs and how they can be better targeted, how long they are needed and with what interventions. But social safety net programs may be one way to ensure more equitable nutrition-sensitive development if they are aligned with local and national needs and an understanding of capacity, resources and timeliness aspects in scaling up.

My personal view

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A number of common determinants are fundamental to successful implementation. These include the political commitment to reduce stunting and other forms of undernutrition; the design and implementation of comprehensive and effective national policy and programs based on sound situation analysis; the presence of trained and skilled community workers collaborating with communities; effective communication and advocacy; and multi-sectoral delivery of services.

Now that many countries are scaling up nutrition programs, it is important to ensure optimal use of resources and achieve results rapidly. If programs are not making the necessary progress, strategies need to be adapted quickly. This requires a monitoring system to assess whether bottlenecks impeding program effectiveness are effectively addressed and the collection of information in real time rather than reliance on large-scale household survey data, which are normally collected intermittently.

The evidence demonstrating the impact of stunting and other forms of undernutrition on survival, individual and national development, and long-term health is irrefutable.

As the world looks to the post-2015 development agenda, it is clear that prevention and treatment of undernutrition must be at its core. The evidence outlined in this chapter, the momentum around tackling the problem, the successes already achieved and the impact on equitable and sustainable poverty reduction show that improving child and maternal nutrition is both achievable and imperative for global progress.

Further reading

UNICEF. *Improving Child Nutrition: The achievable imperative for global progress*. New York, NY, USA: UNICEF, 2013.

Save the Children. *Surviving the first day: State of the world's mothers 2013*.

World Health Organization. *Essential Nutrition Actions: Improving maternal, newborn, infant and young child nutrition*. Geneva: WHO 2013.

2013 *Lancet Series on Maternal and Child Nutrition*.

World Health Organization. *Global nutrition policy review: What does it take to scale up nutrition action?* Geneva: WHO 2013.