What’s at Stake
Childhood stunting remains one of the world’s most fundamental challenges for improved human development. Currently, 162 million children are stunted worldwide, of whom 56% live in Asia and 36% in Africa. Although fewer stunted children live in the Americas, several countries have prevalence rates as high as those found in Asia and Africa. Furthermore, some countries in the WHO European Region still present 20-30% stunting prevalence rates. Current progress is insufficient, and further investment and action are needed to reach the target of reducing the number of stunted children to 100 million by 2025. If reduction rates observed between 1990 and 2010 were maintained, a projected 127 million children under-five would be stunted in 2025, representing a reduction of only 26%.

Stunting is a well-established risk marker for poor child development. Specifically, stunting before age two predicts poorer cognitive and educational outcomes in later childhood and adolescence and has important education and economic consequences at the individual, household and community levels. For example, it has been estimated that stunted children earn 20% less as adults compared to non-stunted individuals. Recent longitudinal studies of children from Brazil, Guatemala, India, the Philippines and South Africa associated stunting with grade failure and a reduction in schooling, where adults who at age two years were stunted completed nearly one year less of schooling compared to non-stunted individuals. Similarly, a study of Guatemalan adults found that those who were stunted as children had less total schooling, lower test performance, lower household per capita expenditure and a greater likelihood of living in poverty. For women, stunting in early life was associated with a lower age at first birth and a higher number of pregnancies and children. And in World Bank estimates, a 1% loss in adult height due to childhood stunting is associated with a 1.4% loss in economic productivity. Suboptimum growth indicative of stunting has been shown to increase the risk of death in childhood from infectious diseases such as diarrhoea, pneumonia and
measles. With regard to longer-term health, stunted children who experience rapid weight gain after age two years have an increased risk of becoming overweight or obese later in life, with associated higher risk of coronary heart disease, stroke, hypertension and type II diabetes. It is in policy makers’ interest, therefore, to make necessary investments in stunting reduction now as a means to promote human capital development and their nations’ economic growth and long-term health, wealth and well-being.

The World Health Assembly Resolution 65.6 (2012) endorsed a comprehensive implementation plan on maternal, infant and young child nutrition, which specified six global nutrition targets for 2025. This policy brief covers the first target: a 40% reduction in the number of children under five who are stunted. The global target for 2025 will be achieved if high-burden countries take stock of their current prevalence, projected population growth, underlying causes of stunting and the resources available to address them; set target annual reduction rates to guide intervention efforts; mobilise necessary resources; and develop and implement systematic stunting reduction plans. Countries need to examine inequalities among populations and identify for priority action particular vulnerable or marginalised groups where large numbers of stunted children cluster. Such an equity-inspired approach is both an ethical imperative and a judicious investment strategy.

**Box 1: What Causes Stunting?**

The proximal contributors to stunted growth and development clustered within the household and family include poor maternal health and nutrition, inadequate infant and young child feeding practices and infection (See Appendix 1 for the WHO Conceptual Framework on Childhood Stunting).

- Maternal nutritional and health status before, during and after pregnancy influences a child’s early growth and development beginning in utero, and contributes importantly to the risk of stunting. Intrauterine growth restriction due to maternal undernutrition (estimated by low birth weight rates) accounts for 20% of childhood stunting. Other maternal contributors to stunting include short stature, short birth spacing and adolescent pregnancy, which interferes with nutrient availability to the foetus due to competing demands of ongoing maternal growth.

- Infant and young child feeding practices that contribute to stunting include suboptimal breastfeeding (late initiation, non-exclusive breastfeeding and early cessation) and inadequate complementary feeding (provision of low quality, quantity and/or unsafe foods).

- Severe infectious diseases lead to wasting, which may have long-term consequences on linear growth depending on severity, duration and recurrence, particularly if there is insufficient food or inappropriate feeding practices to support recovery.

- Sub-clinical infections – resulting from exposure to contaminated environments and poor hygiene – are marked by inflammation and structural changes in the guts of affected children, who become stunted as a result of nutrient malabsorption and reduced gut functioning as a barrier against disease-causing organisms.

- Caregiver neglect or absence, non-responsive feeding practices, inadequate child stimulation and activity and food insecurity due to household poverty can all interact to impede growth and development through multiple pathways. The home environment should ideally provide a clean, safe and stimulating environment to adequately nurture the mother and child.

The influence of underlying causes on stunting is exerted through their impact on nutrient intake/utilisation and infection. Therefore, interventions targeting contextual factors will contribute to reductions in stunting if they lead to improved nutrient intake and reduced infection.
Framework for Action

As illustrated above, the direct causes of stunting cluster within the domains of maternal nutritional and health status and infant/young child feeding and disease, hence the current programmatic focus on the first 1,000 days from a woman’s pregnancy to her child’s second birthday. Stunting begins in utero, and several studies have shown that newborn size is a strong predictor of height-for-age at age 12 months. Macronutrient supplementation of at-risk women, more specifically, balanced energy-protein supplements provided in the third trimester, appears to improve fetal growth and birth weight.

Breastfeeding provides multiple benefits for healthy growth and development. In particular, early initiation and exclusive breastfeeding for six months provides protection against gastrointestinal infections, and is a key source of nutrients during infection. By this means it minimises growth faltering since repeated diarrhoeal infections contribute directly to stunting. Studies in resource-poor settings have associated non-exclusive breastfeeding with poorer growth outcomes because breast milk is displaced or replaced by less nutritious foods that often also expose infants to diarrhoeal infections. Breastfeeding promotes a healthy intestinal microbiota (gut flora) and provides antibodies and other immuno-protective factors that other foods cannot supply. Similarly, continued breastfeeding in the second year contributes importantly to intake of key nutrients that are undersupplied by typically low-quality complementary diets in poor settings.

Among the most effective interventions for improving linear growth and preventing stunting during the complementary feeding period is improving the quality of children’s diets. Specifically, evidence suggests that greater dietary diversity and the consumption of animal source foods are associated with improved linear growth. These have not been tried as standalone large-scale programmatic interventions, but assessments of nutrition-sensitive agriculture, for example, recognise dietary diversification and associated income generation through family farming as likely pathways through which agriculture and food systems could improve nutrition and reduce linear growth faltering, provided that children’s diets (hence nutrient intake) and hygiene (hence morbidity) improve substantially. Consumption of fortified complementary foods was part of the intervention packages that improved linear growth in Bolivia and Mexico. Recent analyses examining stunting in the context of economic development and wealth quintiles suggest that households that can afford diversified diets, including fortified complementary foods, enjoy improved nutrient intake and reduced stunting.

The safety of complementary foods is an important intervention area for preventing microbial contamination due to poor hygiene and mycotoxicity from poor food handling and storage. For the latter, stunting has been linked with the ingestion of aflatoxin-contaminated cereals and nuts. Aflatoxins contribute to stunting through suppression of the immune system (increasing risk of infection) and interference with micronutrient metabolism in the liver. Intestinal worms also contribute to childhood stunting, therefore, preventing infestation through environmental and food hygiene measures and routine deworming could contribute importantly to stunting reduction.

Stunting results from a complex web of household, environmental, socioeconomic and cultural influences. The problem therefore requires that direct nutrition interventions be integrated and implemented in tandem with nutrition-sensitive interventions to achieve maximal benefits, and these should be measured and scrutinised. For example, prevention of infections requires household practices such as hand-washing with soap, the success of which depends on behaviour change to adopt the practice (culture), availability of safe water (water supply) and affordability of soap (socioeconomic status). Similarly, availability of high-quality foods (food supply) and affordability of nutrient-rich foods (socioeconomic status) will affect a family’s ability to provide a healthy diet and thus prevent child stunting.

At programme level, specific contextual factors such as the magnitude of the stunting burden, household wealth, complexity of food value chains and systems’ capacity for service delivery should be taken into account in order to determine the right mix of nutrition-specific and nutrition-sensitive interventions that are most likely to succeed and have a positive impact at national and subnational levels.

Box 2 summarises experiences from four countries suggesting that equity-driven nutrition-sensitive programmes that improve vulnerable sub-populations’ access to and utilisation of services achieve high reductions in national average stunting prevalence in addition to closing gaps between the wealthier and poorer population segments. Common elements that contributed to success in the cited examples include political commitment, multi-sectoral collaboration, integrated service delivery and community involvement in programme activities.
In the last three decades, Brazil has made significant progress in socioeconomic development with marked improvements in the living conditions and health status of its population, including a substantial decline in child undernutrition. Brazilians living on <1.25 US$ per day dropped from 25.6% to 4.8% between 1990 and 2008, as did under-five stunting, from 37.1% in 1974 to 7.1% in 2007. Undernutrition among children between one and two years of age fell from 20% to 5% and less than 2% of children currently suffer from wasting. Five key factors have contributed to Brazil's successes in combating malnutrition: 1) Improvements in the purchasing power of families through increases in the minimum wage and expansion of cash transfer programmes; 2) A rise in female education rates; 3) Improvements and expansion of maternal and child health services; 4) Expansion of water and sanitation systems; and 5) Improvements in the quality and quantity of food produced by small family farms. Moreover, Brazil's success was also driven by political leadership, effective decentralisation, active civil society involvement and conditional and targeted funding. Not only has the Brazilian government demonstrated strong political will to combat malnutrition, it has also invested strategically in policies and programmes to improve access to social services.

In Peru, CRECER (“grow”) – the National Strategy against Child Malnutrition – had as an initial target to reduce stunting by 9% between 2005 and 2011. Under the Prime Minister’s leadership, the strategy involves various sectors: health, education, water and sanitation, housing, agriculture and non-governmental partners, and is implemented at national, regional and district levels. An associated programme, JUNTOS (“together”), is a conditional cash transfer programme targeting the poorest municipalities, with the aim of improving resources at the household level, as well as utilization of health and nutrition services and educational opportunities. Under-five stunting dropped from 22.9% in 2005 to 17.9% in 2010 (a 22% reduction), but improvements in poor rural areas were larger than the national average, thanks to targeting through JUNTOS. Following over a decade (1995-2005) when the national average stunting rate remained unchanged (because rural stunting prevalence stagnated at 40% while urban stunting dropped from 16% to 10%), the dramatic improvements in Peru between 2005 and 2010 highlight the positive effect of a policy reform that integrated nutrition into social protection strategies.

Zero Undernutrition in Bolivia is a joint programming model involving multiple sectors at national, regional and municipal levels. To eradicate undernutrition below age two years, the programme integrates the promotion of exclusive breastfeeding in the first six months and use of fortified complementary foods from six to 23 months in interventions to improve food and nutrition security and access to clean water, sanitation, education and health care and nutrition services. It supports sustainable family farming (production of staples, legumes, vegetables, raising guinea pigs and chickens). Participating families were encouraged to consume their own production and apply the 10 keys to safer foods and healthy diets. After eight months of programme implementation, a survey in 24 food-insecure municipalities found that in 80% of families, children under-five consumed one or more family farm products daily, including a wide variety of vegetables, guinea pig meat and eggs. An independent evaluation documented a promising trend of sustained yearly decline (2008 to 2011) in stunting among children under-two (from 18.5% to 13.5%).

India ranks as the country with the largest number of stunted children under-five – about 61.7 million. However, Maharashtra, a state in Western India, was able to successfully reduce stunting rates in children under-two from 44% in 2005 to 22.8% in 2012. Maharashtra’s success is based on a whole-of-government approach launched in 2005 – the Rajmata Jijau Mother-Child Health and Nutrition Mission. This is a technical, advisory and training body with a three-part mission: advocacy on the importance of the first 1,000 days; a ‘think tank’ providing policy advice to the government on evidence-based interventions; and a platform to foster convergence among different departments with a common objective of reducing malnutrition. Moreover, the Mission built sustainability by promoting community-led and -managed programmes, inducing behaviour change by using modern methods of technology and media as well as traditional methods of printed educational material and word of mouth, and encouraging additional data collection to measure progress and reveal gaps. These initiatives created a significant impact in the nutrition of children under the age of two.
Interdependent influences on stunting are rooted in the political economy, health and health care, education, society and culture, agriculture and food systems, water and sanitation and the environment. In order to avoid working in silos, multisectoral approaches should be used to define interventions based on an understanding of the interplay among key sectors. In addition, however, corresponding sector-specific policies are necessary to underpin the aforementioned multisectoral initiatives.

For example, education policies are needed that enroll and keep girls in school throughout adolescence, as much to delay marriage and childbearing as to educate and empower future mothers to make good economic and health choices for themselves and their children. Similarly, laws on the marketing of breast-milk substitutes and labour laws should provide maternity protection in support of exclusive and continued breastfeeding, including in the workplace, and improved maternal health. Health sector policies should guarantee mothers’ access to pre-pregnancy, antenatal and postnatal care that best protects their general and reproductive health as well as that of their offspring, creating a positive effect in the life-cycle. Meanwhile, agriculture and food systems policies and innovations are required that will improve household food security and guarantee a diversified and safe food supply. Behaviour change communication efforts should also aim to promote the preparation and feeding of nutrient-dense complementary foods. Environmental protection policies should provide for improved hygiene, sanitation and water quality to reduce infections. And, where possible, social protection programmes should increase purchasing power and access to services and amenities that target the most vulnerable population groups, and include nutrition-specific components.
Priority Actions to Reduce Stunting

Stunting is interlinked with the five other global nutrition targets (anaemia in women of reproductive age, low birth weight, childhood overweight, exclusive breastfeeding and wasting). This presents opportunities for synergistic policy and programmatic approaches to address multiple targets simultaneously using multisectoral platforms that are being established in a growing number of countries to improve maternal and child nutrition.

Given that wasting (linked with recurrent episodes of infectious disease) increases the cumulative risk of stunting, programmes for the prevention and management of diarrhoea and severe acute malnutrition can contribute positively to stunting reduction. Similarly, maternity protection policies and legislation to promote and protect adequate breastfeeding and complementary feeding choices and practices are beneficial to stunting reduction. In this regard, countries should take advantage of available regulatory instruments such as the International Code of Marketing of Breast-Milk Substitutes food safety regulations in compliance with the Codex Alimentarius to protect infant and young child nutrition. To the extent that maternal anaemia prevention is integrated in a holistic maternal health care package that improves overall maternal nutrition and health, efforts to address this problem will also contribute to reductions in low birth weight and stunting. Finally, measures taken to promote healthy growth and prevent stunting also reduce the risk of overweight.

It is recommended that countries begin with a situation analysis to establish how many children under-five are stunted, where they live and the determinants of stunting in specific geographical and social contexts so that actions taken are tailored to specific needs. A deliberate equity-driven policy targeting, as a priority, the most vulnerable populations is an effective strategy to reduce national averages.

Recommended actions for stunting reduction include:

1. Enact policies and/or strengthen interventions to improve maternal nutrition and health, beginning with adolescent girls (weekly iron and folate supplementation, prevention and treatment of infections and nutrient supplementation during pregnancy and maternity protection policies for pre- and postnatal care).

2. Protect and promote exclusive breastfeeding in the first six months to provide “secure” nutrition and protect infants from gastrointestinal infections.

3. Promote consumption of healthy, diversified diets including high-quality, nutrient-rich foods in the complementary feeding period (six to 23 months).

4. Improve micronutrient intake through food fortification, including complementary foods, and use of supplements when and where needed.

5. Foster safe food storage and handling practices to avoid infections from microbial contamination and mycotoxins.

6. Strengthen community-based interventions to protect children from infections (diarrhoea and malaria), intestinal worms and environmental causes of sub-clinical infection through improved water, sanitation and hygiene (WASH).

7. Incorporate linear growth assessment in child health routines to provide critical, real-time information for target setting and progress monitoring.

8. Integrate nutrition in health promotion strategies and strengthen service delivery capacity in primary health systems and community-based care for prevention of stunting and acute malnutrition, supported by social protection programmes where feasible.

While these actions are the primary responsibility of the formal governance structures responsible for nutrition, it is important to recognize that donors and informal institutional networks (national, subnational and community-based) play critical roles in shaping policies, implementing programmes and engaging communities.
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<th>Other Resources to Consult</th>
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<tr>
<td>Landscape Analysis</td>
<td>Landscape Analysis on Countries’ Readiness to Accelerate Action in Nutrition; includes tools to support development of policy options for scaling up. (<a href="http://www.who.int/nutrition/landscape_analysis/en/">http://www.who.int/nutrition/landscape_analysis/en/</a>)</td>
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<td>Mainstreaming Nutrition Initiative</td>
<td>Highlights importance of high-level political attention, but also of strengthening the design of interventions and delivery systems, defining targets and giving focus to implementation of nutrition programmes. (<a href="http://www.unscn.org/layout/modules/conferences/files/DEC14_DAVID_PEL_SCN_Rome_Mtg.pdf">http://www.unscn.org/layout/modules/conferences/files/DEC14_DAVID_PEL_SCN_Rome_Mtg.pdf</a>)</td>
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<td>Lancet Series 2008; 2013</td>
<td>Identify effective actions, costing and policy and programmatic considerations for addressing maternal and child malnutrition.</td>
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<td>WHO Colloquium on Stunting Reduction</td>
<td>Horizontal and vertical coherence requires mutually-reinforcing processes to foster grassroots participation, sub-national level service delivery and national coordination. (<a href="http://www.who.int/nutrition/publications/childhood_stunting_report/en/">http://www.who.int/nutrition/publications/childhood_stunting_report/en/</a>)</td>
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<td>Issue 40 of the SCN News</td>
<td>Papers reflecting on how to change food systems for better nutrition, with examples of countries and cities that are integrating agriculture and nutrition. (<a href="http://www.unscn.org/files/Publications/SCN_News/SCNNEWS40_final_standard_res.pdf">http://www.unscn.org/files/Publications/SCN_News/SCNNEWS40_final_standard_res.pdf</a>)</td>
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<td>State of Food and Agriculture 2013</td>
<td>The SOFA 2013 report (<a href="http://www.fao.org/publications/sofa/2013/en/">www.fao.org/publications/sofa/2013/en/</a>) provides a very good analysis of nutrition problems by level of development of countries, as well as of food value chains by level of development.</td>
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<tr>
<td>IDS – Fighting Maternal and Child Malnutrition</td>
<td>Analyses the political and institution determinants of delivering a national multisectoral response in six countries – 2012 (<a href="http://www.ids.ac.uk/v/dmfile/DFID_ANG_Synthesis_April2012.pdf">http://www.ids.ac.uk/v/dmfile/DFID_ANG_Synthesis_April2012.pdf</a>)</td>
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Appendix 1

Childhood Stunting: Context, Causes and Consequences

WHO Conceptual Framework

Consequences

- Stunted growth and development

Causes

- Household and family factors
- Inadequate complementary feeding
- Breastfeeding
- Infection

Context

- Political economy
- Health and Healthcare
- Education
- Society and Culture
- Agriculture and Food Systems
- Water, Sanitation and Environment

Community and societal factors

- Maternal factors
- Home environment
- Poor quality foods
- Inadequate practices
- Food and water safety
- Inadequate practices
- Clinical and subclinical infection

40. Animal source foods are the best sources of high-quality nutrients. In vegetarian diets where cereals and legumes are the main sources of high-quality nutrients, nutrient supplements or fortified foods can fill gaps.