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Overview of the Nutrition Situation in Four Countries in South and Central Asia

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The intended purpose of this report is to provide a broad overview of the status of nutrition in Bangladesh, India, Nepal, and Tajikistan in order to inform potential US-supported efforts. To view more information about USAID's Global Health and Feed the Future (FTF) initiatives and their extensive nutrition contributions, please visit: www.usaid.gov/what-we-do/global-health/nutrition.

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Contents

Abbreviations and Acronyms	iii
1 Introduction.....	1
2 Background	4
Causes of Malnutrition of Particular Concern in Asia	4
Preventing and Treating Malnutrition Effectively	7
U.S. Government Efforts to Reduce Malnutrition and USAID’s Investments in Nutrition in Asia	16
3 Nutritional Status in Bangladesh, India, Nepal, and Tajikistan.....	18
Low Birth Weight, Under-5 Mortality, Stunting, Underweight, and Wasting Among Children.....	20
Maternal Underweight, Short Stature, and Overweight/Obesity	23
Anemia	26
Micronutrient Deficiencies: Vitamin A and Iodine.....	28
4 Potential Causes of Malnutrition in Bangladesh, India, Nepal, and Tajikistan.....	30
Immediate Causes	31
Underlying Causes	34
Basic Causes	34
5 Nutrition Priorities for Bangladesh, India, and Nepal	40
Priority 1: Addressing Nutrition of Women of Reproductive Age and Adolescent Girls and Low Birth Weight.....	40
Priority 2: Addressing Wasting and Stunting Among Children.....	41
Priority 3: Addressing Micronutrient Deficiencies and Anemia.....	42
Priority 4: Addressing Nutrition Governance	43
6 Nutrition Priorities for Tajikistan	44
Priority 1: Addressing Stunting and Wasting Among Children.....	44
Priority 2: Addressing Iodine Deficiency	45
Priority 3: Addressing Anemia and Micronutrient Deficiencies.....	45
7 Recommendations for Bangladesh, India, Nepal, and Tajikistan	47
South Asia (Bangladesh, India, and Nepal)	47
Tajikistan.....	47
Country Data Sources.....	49
References.....	51
Appendix 1. Methods.....	55
Appendix 2. Additional Data	56
Appendix 3. Glossary of Terms	57

LIST OF TABLES

Table 1. Number of Children Under 5 Affected by Malnutrition in South and Central Asia	23
Table 2. Characteristics of Women of Reproductive Age (15–49 Years) and Child Health	37
Table 3. Country Characteristics	38
Table A.1. Nutritional Status of Women of Reproductive Age and Children Under 2 and Under 5.....	56

LIST OF FIGURES

Figure 1. Evidence-Based Interventions to Improve Maternal and Child Nutrition	8
Figure 2. Neonatal, Infant, and Under-5 Mortality Rates (per 1,000 Live Births) in Bangladesh, India, Nepal, and Tajikistan	21
Figure 3. Trends in the Proportion (%) of Children Under 5 Who are Underweight	21
Figure 4. Trends in the Proportion (%) of Children Under 5 Who are Stunted	22
Figure 5. Trends in the Proportion (%) of Children Under 5 Who are Wasted	22
Figure 6. Stunting (%) Among Children Under 5 by Maternal Education Levels.....	22
Figure 7. Stunting Prevalence of Children Under 5 by Wealth Index	23
Figure 8. Trends in Prevalence (%) of Short Stature (Height < 145 cm) Among Women of Reproductive Age	24
Figure 9. Trends in Prevalence (%) of Underweight (BMI < 18.5) Among Women of Reproductive Age	24
Figure 10. Prevalence (%) of Underweight (BMI < 18.5) Among Women of Reproductive Age by Age Group	25
Figure 11. Prevalence (%) of Short Stature (Height < 145 cm) Among Women of Reproductive Age.....	25
Figure 12. Prevalence (%) of Overweight and Obesity (BMI > 25) among Women of Reproductive Age	26
Figure 13. Prevalence (%) of Anemia Among Children Under 2 Years, Children Under 5 Years, and Women of Reproductive Age	27
Figure 14. Breastfeeding Practices (%).....	32
Figure 15. Complementary Feeding Practices of Children 6–23 Months (%).....	33
Figure 16. Trends in the Percent of Women 15–19 Years Who Have Begun Childbearing by 19.....	35
Figure 17. Trends in Adolescent Fertility (.....	36

Abbreviations and Acronyms

AG/NRM	agriculture/natural resource management
ARI	acute respiratory infections
BMI	body mass index
DHS	Demographic and Health Surveys
dL	decilitre(s)
ENA	Essential Nutrition Actions
FANTA	Food and Nutrition Technical Assistance III Project
FAO	Food and Agriculture Organization of the United Nations
g	gram(s)
Hb	hemoglobin
IYCF	infant and young child feeding
L	liter(s)
LBW	low birth weight
MCHN	maternal and child health and nutrition
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Surveys
MOH	Ministry of Health
SHOUHARDO	Strengthening Household Abilities for Responding to Development Opportunities
SUN	Scaling Up Nutrition
ug	microgram(s)
UIC	urinary iodine concentration
US\$	United States dollars
USAID	U.S. Agency for International Development
UNSCN	United Nations System Standing Committee on Nutrition
USG	U.S. Government
WASH	water, sanitation, and hygiene
WFP	World Food Programme
WHO	World Health Organization

1 Introduction

In the last 5 years interest in addressing malnutrition among young children—particularly those under 2 years of age—and pregnant and lactating women has undergone a global resurgence. The increased attention to this neglected area of maternal, newborn, and child health was supported by analyses in 2008 (Black et al.) quantifying the immense contribution of undernutrition to child mortality—recent analyses estimate that approximately 45% of childhood deaths in 2011 were caused by undernutrition (Black et al. 2013). Analyses also describe the long-term negative and frequently irreversible effects of undernutrition in early life for current and future generations, including impaired cognitive development, lower attained schooling, lower economic productivity, lower birth weight of offspring, and potentially increased risk of certain chronic disease in adult life (Victora et al.

2008). Action to tackle this neglected area was supported by outlining a set of interventions that were known to be not only effective at reducing undernutrition (Bhutta et al. 2008) but also highly cost-effective (Copenhagen Consensus 2012). Since then, there has been an increased commitment by countries, donors, and international agencies to focus on effective interventions during the opportune window to intervene to prevent malnutrition—during the “first 1,000 days,” from pregnancy through the first 2 years of life—when interventions will have a high return. Initiating and maintaining effective national action to reduce malnutrition, however, has proved challenging in many settings, and will be helped by multisectoral approaches with strong political commitment and effective coordination mechanisms that deal with underlying causes (such as income poverty or gender inequity) in addition to providing evidence-based nutrition-specific interventions.

Tackling malnutrition in Asia is critical for several reasons:

- Asia leads other world regions with not only the highest percentage of children under 5 who are underweight or wasted (21.9% and 11.2% respectively, as of 2011), but given the population density across the region, it is also home to the greatest total number of children under 5 who are stunted, wasted, or underweight (103.5 million, 39.2 million, and 76.6 million respectively, as of 2011¹) (Black et al. 2013)
 - Of the subregions in Asia, South-Central Asia² has the highest prevalence and absolute numbers of children who are stunted (37.8%, 71.5 million), wasted (16.1%, 30.4 million), and underweight (31.8%, 60 million) (Black et al. 2013)
- The burden of malnutrition in this region alone is likely to hold the world back from achieving Millennium Development Goal (MDG) targets and potentially the new global 2025 targets for nutrition
- Maternal undernutrition—including short stature and low body mass index (BMI)—is a critical and neglected problem throughout parts of Asia, contributing to high rates of low birth weight (LBW) and intrauterine growth restriction in many countries, which top other world regions in terms of both percentages and absolute number of live births affected (Black et al. 2008)

USAID Focus Countries Discussed in this Report

South Asia:

- Bangladesh
- India
- Nepal

Central Asia:

- Tajikistan

¹ The countries included in Asia for these estimates are as defined by the United Nations for regions and subregions (see <http://unstats.un.org/unsd/methods/m49/m49regin.htm>). These estimates exclude Japan but include both India and China.

² South-Central Asia includes Afghanistan, Bangladesh, Bhutan, India, Iran, Kazakhstan, Kyrgyzstan, Maldives, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkmenistan, and Uzbekistan.

Asia encompasses a diverse range of geography, cultural, religious, and ethnic groups, as well as varying levels of political stability, economic development, and urbanization. Understanding the current nutrition situation as well as the potential causes of malnutrition in different countries of Asia is crucial for supporting country-specific and country-led programs and policies to effectively address this pervasive problem.

The U.S. Agency for International Development (USAID) works in 31 countries in Asia, four of which are discussed in this report representing the South and Central regions of Asia: Bangladesh, India, Nepal, and Tajikistan. Three of these four countries (Bangladesh, India, and Nepal) belong to the 20 countries with the highest burden of malnutrition which constitute 80% of the world's undernourished children (Bryce et al. 2008). These four countries will serve to provide a snapshot of the nutrition situation in a portion of the South and Central Asian regions where malnutrition is highly prevalent and identify potential causes experienced in this part of the world, which are likely shared among many countries in Asia with similar characteristics.

USAID has articulated its goals for reducing malnutrition globally (see **Box 1**), and with increased nutrition-specific interventions and nutrition-sensitive activities, USAID hopes to reduce stunting by 20% in the next 5 years. The U.S. Government (USG) has doubled its funding for nutrition and tripled its funding for agriculture since 2008, which includes US\$1 billion in nutrition-specific interventions and US\$9 billion in nutrition-sensitive activities for the fiscal years 2012–2014 (The White House 2013). Given the number of children affected by stunting in Asia and the fact that the majority of the world's undernourished children are in this region, USAID has the opportunity to expand nutrition investments and better leverage existing investments in these four countries to have a greater impact on reducing not only the regional burden of malnutrition but also the global burden, while also fulfilling its objectives of reducing malnutrition by 20 to 30% globally. The main goals of this report are to:

- Discuss potential causes and drivers of malnutrition, as well as solutions, in general and specific to the Asian region
- Describe the current nutrition situation of children under 5 years of age (with specific emphasis on children under 2) and women of reproductive age (adolescents and pregnant and lactating women when data permit) in the selected countries
- Provide an overview of current programs and policies that are directed at improving nutrition (including both preventative and curative measures) among these vulnerable groups in each country
- Provide recommendations for prioritizing and increasing investments in nutrition and better leveraging existing investments for greater impact on reducing malnutrition

This report first presents causes of malnutrition of concern in Asia, potential solutions, and current global and USG efforts to reduce it (**Section 2**). Next, regional analysis is provided in **Section 3** that compares data on nutrition status and trends across and within Bangladesh, India, Nepal, and Tajikistan (see **Appendix 1** for methods used). From this analysis, potential causes of malnutrition are identified in **Section 4** followed by priorities to address these causes (**Sections 5 and 6**) and recommendations for USAID (**Section 7**). This report also includes separate individual **nutrition profiles** for each country consisting of an overview of programs and policies that address nutrition for young children and women of reproductive age, data on nutrition status and trends, priority nutrition problems and their probable causes, and recommendations for dealing with them effectively.

Box 1. USAID’s Strategic Approach to Nutrition: Improving Nutrition for Women and Young Children

Good nutrition is central to successful development. USAID’s strategic approach to nutrition focuses on:

- Preventing malnutrition through a comprehensive package of maternal, infant, and young child nutrition programs
- Combating micronutrient deficiencies with targeted supplementation to vulnerable groups and food fortification
- Managing moderate or severe acute malnutrition through community-based programs
- Providing nutritional care and support for people living with HIV
- Improving nutritional outcomes in food security programs

By 2015, USAID’s nutrition programs will have reduced malnutrition by 20 to 30% in 17 priority Feed the Future and Global Health Initiative countries.

Source: USAID 2013

2 Background

Causes of Malnutrition of Particular Concern in Asia

This section discusses determinants of malnutrition among pregnant and lactating women and young children in Asia and several important risk factors that are particularly relevant to this region.

Dietary intake. Both dietary quantity (total amount of energy consumed) and quality (dietary diversity and intake of specific nutrients) are of concern in Asia. Traditionally vegetarian diets in some countries, low intake of micronutrient-rich foods (particularly meat and animal source foods, but also certain vegetables and fruits), high intake of compounds that inhibit absorption of key nutrients such as iron and zinc, and monotonous diets based largely on staple grains such as rice are considered prime contributors to micronutrient deficiencies and anemia in Asia. Micronutrient deficiencies of particular concern in Asia include iron, zinc, vitamin A, iodine, and calcium deficiencies.

Low birth weight and maternal nutritional status. LBW in developing countries is primarily due to intrauterine growth restriction rather than premature birth and is both a cause and consequence of maternal and child malnutrition. Asia leads other world regions in both the percentage of children who are born with LBW (18% for Asia overall, ranging from 5.9% in East Asia to 27% in South and Central Asia [Black et al. 2008]) as well as the total absolute number of live births suffering from this condition. The prevalence and total number of infants born “small for gestational age,” indicating some level of fetal growth restriction, is much higher—approximately 30% in Asia overall, ranging from a low of 6.8% in East Asia to a high of 44.6% in South Asia (Black et al. 2013).

Infants who are born with LBW are at greater risk of death during the neonatal period (particularly due to birth asphyxia and infections, including sepsis, pneumonia, and diarrhea) (Black et al. 2008) and also underweight and stunting as children. Compared to its other global regions, the countries that make up the World Health Organization’s (WHO’s) Southeast Asia region have one of the highest percentages (52%) of mortality for children under 5 years of age attributable to neonatal deaths (Liu et al. 2012).³

Long-term consequences of LBW and intrauterine growth restriction are also apparent, including increased risk of underweight and stunting in childhood. Girls who do not grow adequately during childhood nor catch-up during adolescence, reach their childbearing years with short stature, which can contribute to the risk of LBW in their offspring (Han et al. 2012) thus continuing the intergenerational transmission of malnutrition. Maternal short stature is also associated with increased risk of complications during delivery due to smaller pelvic size. If a girl becomes pregnant during adolescence—a common occurrence in South Asia in particular—further height gain is prevented, and by 6 months postpartum, previously pregnant adolescents have lower BMI, fat mass, and mid-upper arm circumference as compared to their nulligravida peers (Rah et al. 2008). Maternal underweight has also been shown to increase the risk of LBW and premature birth (Han et al. 2011), as do other nutritional deficiencies, particularly of micronutrients such as iron. Asia has some of the highest rates of maternal malnutrition in the world; in South Asia in particular, the rates of maternal undernutrition (in terms of short stature and underweight, reflecting both chronic energy deficiency as well as micronutrient deficiencies) range from 10 to 40% of women of reproductive age and are considered critical to address (Ahmed et al. 2012).

³ The WHO Southeast Asia region includes three countries in this report (Bangladesh, India, and Nepal) as well as Bhutan, Burma, Indonesia, Korea, Maldives, Sri Lanka, Thailand, and Timor Leste (<http://www.searo.who.int/countries/en/>). The Western Pacific region was estimated to have a slightly higher percentage of under-5 deaths, 54%, attributable to neonatal conditions (Liu et al. 2012).

Gender inequity, in terms of access to food, health care, income, education, and decision-making power (discussed later in more detail), is thought to be a primary cause of maternal malnutrition in Asia (ibid).

Breastfeeding practices. Breastfeeding is the cornerstone of good infant nutrition, and although breastfeeding of long duration is fairly universal throughout Asia, early initiation of breastfeeding (within the first hour of birth) and exclusive breastfeeding through the first 6 months of life are not common in many countries of the region (Lutter et al. 2011). Delaying initiation of breastfeeding and introducing other liquids prior to 6 months of age (including pre-lacteal feeds) increases the risk of disease and death: in one study from south India, delaying the initiation of breastfeeding past the first 24 hours increased the risk of death by 78% (Garcia et al. 2011).

Complementary feeding practices. The complementary feeding period, when food and liquids other than breast milk are introduced to the infant's diet, constitutes a high-risk period for development of malnutrition and disease, particularly diarrhea. Inadequate complementary feeding practices have been identified as a major cause of malnutrition globally, particularly in Asia. Many aspects of complementary feeding are inadequate—the timing of introduction of solid/semi-solid food, the frequency of feeding, the choice of foods, and the way in which they are prepared. Recent analyses of complementary feeding practices in three of the countries of interest in this report (Bangladesh, India, and Nepal) found that practices were largely inadequate in several aspects of complementary feeding, particularly dietary diversity, which ranged from 17% of children 6–23 months of age in India eating from a minimum of four different food groups in the previous day, to 34% and 42% of similar children in Nepal and Bangladesh, respectively (Senarath et al. 2012).

Disease; unhealthy environments; water, sanitation, and hygiene; and access to health care. Of diseases, globally and in Asia, diarrheal diseases affect the greatest number of individuals—close to 1.3 billion people in WHO's Southeast Asia region according to estimates from 2004 (WHO 2008)—followed by pneumonia and other lower respiratory infections—affecting 135 million in WHO's Southeast Asia region as of 2004 (ibid). Young children, particularly those between 6–23 months of age, have a particularly high incidence of acute respiratory infections (ARI) (which include both lower and upper respiratory infections), diarrhea, and fever (a potential indicator of malaria). Pneumonia, diarrhea, and malaria represent the three leading causes of mortality in children under 5 globally (Liu et al. 2012). In WHO's Southeast Asia region, pneumonia accounts for 22% of under-5 deaths; diarrhea accounts for 11%, and malaria accounts for 1% (ibid).

Mortality from diarrhea has decreased in recent decades, most likely due to improved case management including use of oral rehydration therapy and improved counseling on feeding during illness (Jamison et al. 2006). Handwashing with soap, providing access to safe water (including household treatment of water for drinking), and appropriate sanitation services to dispose of solid waste will all contribute to reductions in diarrheal morbidity as human feces are the primary source of diarrheal pathogens (ibid). Handwashing has the most consistent preventive effect across populations (Cairncross et al. 2010). In an analysis of determinants of maternal and child malnutrition, sanitation, particularly pit latrine use, had a much higher positive effect on nutrition outcomes in South Asia than in sub-Saharan Africa or Latin America and the Caribbean (Smith et al. 2003). Exclusive breastfeeding and improved complementary feeding practices (including preventing contamination of complementary foods as well as providing nutritionally adequate foods before, during, and after illness) are also essential in reducing diarrhea incidence (Jamison et al. 2006). Rotavirus and measles vaccinations also prevent diarrhea (ibid).

Viral infections are responsible for 40–50% of pneumonia cases in children under 5 in developing countries (Jamison et al. 2006). Two preventative strategies are widespread vaccination against viral and

bacterial causes of lower respiratory infections and effective case management including early detection (ibid). ARIs are also impacted by high levels of pollution in many settings, including indoor pollution created by poor housing, overcrowding, and use of organic fuel for cooking (Bhutta et al. 2004). Lower-emission stoves and/or clean fuel help to reduce ARIs (WHO/UNICEF 2013).

Reductions in morbidity and mortality from disease in many countries in Asia are hampered by inadequate access to or utilization of health services. In many areas, particularly those that are rural or remote, health care facilities may be sparse requiring traveling long distances for care, and families may not utilize care when children become sick. Where facilities exist, they are frequently understaffed and under-resourced, lack supplies and equipment, and the cost of services can make them inaccessible to certain segments of the population. In addition, the quality and availability of nutrition services is particularly limited in some countries, which may limit the impact that nutrition interventions can have on disease.

Poverty, food security, population density, and land ownership. Malnutrition has long been known to be a consequence of poverty. Poverty is a critical underlying determinant that influences a child's nutritional status through several pathways: hindering food security and access to diverse and nutritious food, reducing a child's ability to receive adequate care, and restricting access to health services and treatment (Black et al. 2008). In turn, malnutrition contributes to poverty, as poor nutrition in utero and early childhood adversely affects cognitive and physical development ultimately leading to reduced human capital and economic productivity, further perpetuating the cycle of poverty. South Asia in particular is heavily burdened by poverty with over a third of the world's extreme poor residing in India in 2010 (and another 5% residing in Bangladesh) (United Nations 2014). Poverty in Asia is influenced by food security, population densities, and lack of land ownership; all three of which also impact nutritional status. In many parts of Asia, particularly in South Asia, population density is high, limiting the amount of land a household has access to. Increasing landlessness as a result of increasing population pressure on the land is a significant factor in the changing nature of household food security and poverty. In the span of just a generation, population density has resulted in families relying increasingly on off-farm income sources to subsist rather than being able to subsist from the land they own. This transition has meant that poor families are net buyers of food, and not net producers or net sellers of food. As a result, purchasing power and household and individual income levels play an important role in determining how food secure a household is. Further, the need for off-farm income that largely determines purchasing power means that when food prices fluctuate, families pay a higher price for the same amount of staple foods and are less able to afford diverse nutrient-dense foods such as fruits and vegetables. Land ownership laws can also negatively affect land ownership and food access, particularly if they discriminate against women. Female-headed households in Bangladesh are significantly more food insecure than male-headed households (World Food Programme [WFP] Bangladesh 2012). Finally, climate change (including flooding, land erosion, and rising sea levels) has additional detrimental effects on land ownership in Asian countries affected.

Gender inequality and women's status. The importance of the education and social status of females relative to males in improving nutritional and health status of children has been documented (Smith et al. 2003). The low status of women in South Asia in particular has been identified as a basic cause of poor maternal and child nutrition and health outcomes (Bhutta et al. 2004). Women of low social status generally have less control over household resources, stricter time constraints, less access to information and health services, poorer mental health, and lower self-esteem (Smith et al. 2003). All of these factors contribute to a woman's own nutritional status (through her nutritional and care practices for herself, including access to medical care) and worsens her own health outcomes, thus affecting the nutrition and health outcomes of her offspring, both through biological pathways as well as the care she is

able to provide to them. In an analysis of three world regions—South Asia, sub-Saharan Africa, and Latin America and the Caribbean—the negative impact of women’s social status on the nutritional status of their children was the strongest in South Asia, and within South Asia, women’s status appeared to be a stronger factor than the other two determinants also identified: urbanization and sanitation (ibid). A recent assessment of mental health and depression among women in both Vietnam and Bangladesh found that not only did depression affect 1 in 3 and 1 in 2 women, respectively, but in both countries it was significantly correlated with greater incidence of ARIs and diarrhea, and with greater levels of stunting in Bangladesh and greater levels of wasting in Vietnam (Nguyen et al. 2013).

Civil and political unrest. Although not prevalent in all countries of Asia, development has been hindered in many countries of the region due to war and political unrest. Of the countries included in this review, Nepal and Tajikistan have most recently suffered from political unrest/instability or civil war. Populations experiencing and recovering from such political instability and/or violence will be inequitably affected: women and children are most severely affected by civil strife, and the poor experience particular health and nutrition inequities during the rebuilding period (Hong and Mishra 2006). As an example, in Tajikistan, which suffered from a civil war in the 1990s after declaring independence, health funding collapsed and out-of-pocket payment for health services became the main source of funding, which had severe consequences for the poorest groups in society (Khodjamurodov and Rechel 2010). Destruction of basic services—such as schools—and infrastructure, as well as continued insecurity, prevent access to and utilization of needed services, which negatively impact health and nutrition outcomes, particularly those of women and children.

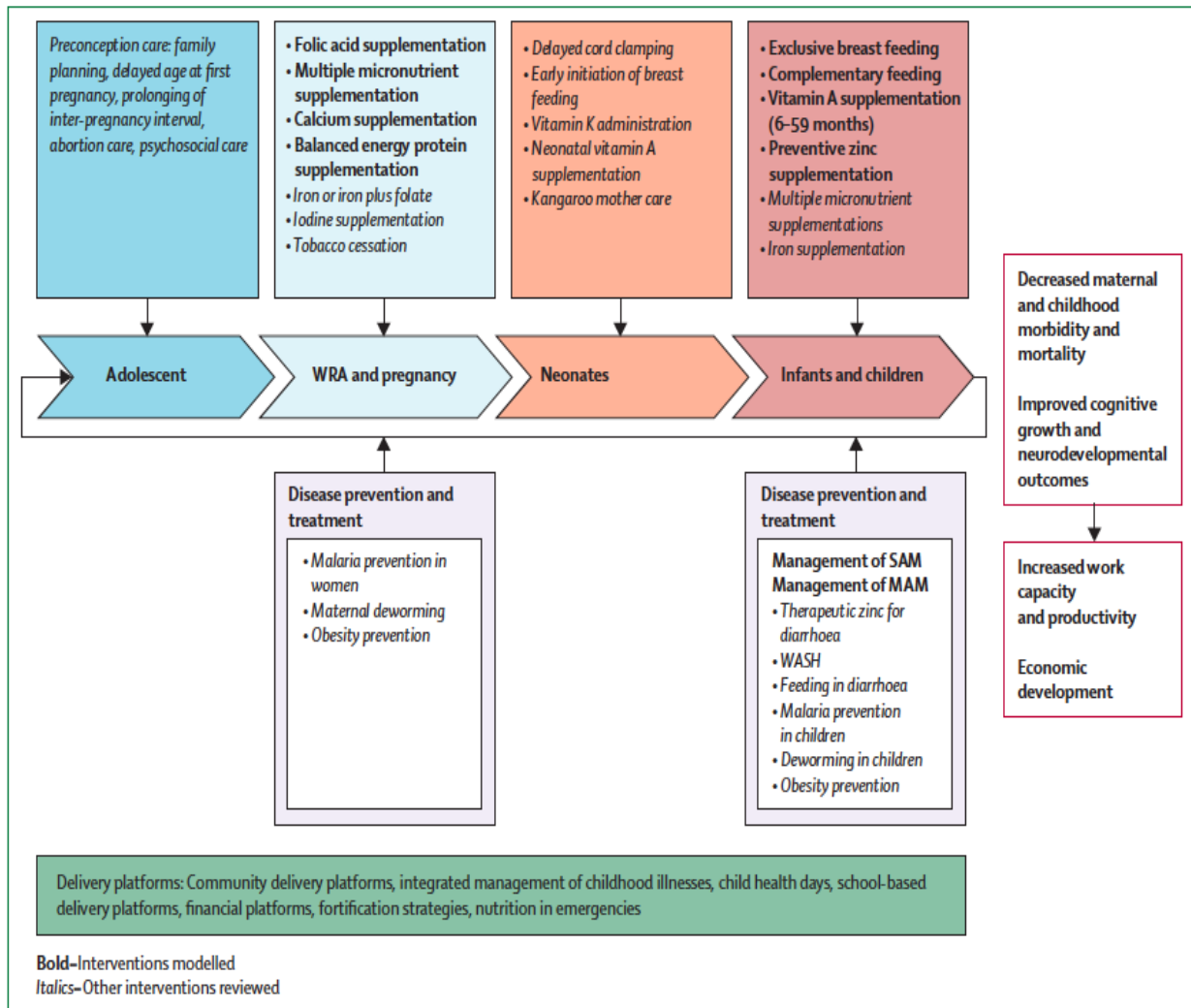
Governance. The role of government (or lack thereof) is a critical underlying factor contributing to malnutrition. Tackling malnutrition requires that governments demonstrate good “nutrition governance” through: sustained political commitment to improving nutrition that can withstand changes in leadership and other political upheavals; the capability to coordinate actions across different sectors (e.g., health, sanitation, and agriculture) and levels of government (national to local); designating resources for action in nutrition that will be most effective (i.e., reaching those most affected by malnutrition); working effectively with other donors and stakeholders active in the same arena; being accountable to those most vulnerable to nutrition; and providing effective, responsive, and transparent action to address malnutrition issues (Engesveen et al. 2009; Mejia Acosta and Fanzo 2012). Thus it is not surprising that countries with higher levels of government effectiveness, political stability, and rule of law have been shown to have lower rates of malnutrition (Pridmore and Carr-Hill 2010). The strength of a country’s nutrition governance can be partially measured through assessing the presence or absence of concrete plans and policies addressing nutrition, resources dedicated toward action in nutrition, whether nutrition is a component of national development strategies, the priority that is given to nutrition relative to other sectors, the presence of inter-sectoral coordination committees, and regular data collection and monitoring of nutrition indicators (Engesveen et al. 2009). The recently launched Hunger and Nutrition Commitment Index ranks countries on 22 indicators of political commitment to reduce hunger and malnutrition and looks at three areas of government action: (1) policies and programs, (2) legal frameworks, and (3) public expenditures (Lintelo et al. 2013). However, the existence of policies and inter-sectoral coordination committees may not tell the whole story nor be indicative of greater progress in combating malnutrition (Mejia Acosta and Fanzo 2012).

Preventing and Treating Malnutrition Effectively

The 2008 *Lancet* series on maternal and child undernutrition provided an impetus for the reinvigoration of nutrition efforts and their integration into other sectors. Although nutrition has been on the global development agenda for many years—MDG 1 aims to reduce the proportion of those suffering from

hunger by half between 1990 and 2015, and other MDG targets indirectly involve nutrition—the *Lancet* series analyses provided compelling evidence that not only is undernutrition a serious and neglected public health problem (Black et al. 2008) but that there are effective solutions to address it (Bhutta et al. 2008). Many of these solutions are also extremely cost-effective, as shown by analysis by the Copenhagen Consensus in 2012, which identified interventions to prevent undernutrition in young children (including micronutrient supplementation, deworming, complementary feeding, and behavior change strategies) as the number one investment to advance global welfare in developing countries due to the very high cost-benefit ratios of these interventions. These “nutrition-specific” interventions (as outlined in **Figure 1**) tackle the most proximate determinants of malnutrition. **Figure 1** also demonstrates the range of target groups that need to be reached to address malnutrition effectively—from adolescents to pregnant women (and women of reproductive age prior to conception) to childhood.

Figure 1. Evidence-Based Interventions to Improve Maternal and Child Nutrition



Source: Bhutta et al. 2013

Nutrition-specific interventions will work to reduce malnutrition in the short term. However, to achieve long-term reductions in maternal and child malnutrition, improvements in the underlying and basic causes of malnutrition through a multisectoral approach that includes a broader set of “nutrition-sensitive” sectors—such as agriculture, health, family planning, social protection, and education—and addresses the

realities of each country will need to occur. (See **Box 2** for examples of nutrition-specific and nutrition-sensitive interventions). A recent analysis of nutrition-sensitive interventions and programs in agriculture (homestead food production and bio-fortification), social safety nets (cash or in-kind transfers), early child development, and education (particularly of parents) found that there was enormous potential to enhance the impact of nutrition-specific interventions through these complementary programs (Ruel et al. 2013). However, the effect of these complementary programs on nutrition outcomes is still largely unknown (with a few exceptions) due to programs that didn't originally take nutrition into account in their design, actions, and goals, as well as poor-quality evaluations. Thus to improve impact on nutrition, nutrition-sensitive programs should aim to:

- Improve targeting of beneficiaries based on their nutritional vulnerability (i.e., focused on the 1,000-day window) and geography (based on poverty, location, and level of food insecurity)
- Use “conditions” or incentives that address health and nutrition as a requirement for receipt of cash transfers (e.g., conditional cash transfers for education of girls or for delaying first pregnancies)
- Include nutrition goals and actions within these programs and ensure that program design and delivery/implementation will effectively address nutrition
- Engage women and include interventions to improve women's health, nutrition, time allocation, and empowerment
- Explore ways to serve as a platform for the delivery of nutrition-specific services (e.g., distribution of fortified foods through agriculture or social safety-net programs) (Ruel et al. 2013).

In addition to a multisectoral approach incorporating nutrition-specific and nutrition-sensitive programming, strong nutrition governance is essential. Mechanisms to coordinate efforts across different government sectors and levels of government (national, regional, and local), and providing leadership at the highest level of government, has been shown to be a commonality across countries that have seen significant decreases in malnutrition in recent years (Ruel 2008) (see **Box 3** on nutrition governance). As a part of nutrition governance, increasing the participation of communities in decision-making and creating demand for improved nutrition has also been found to be effective (Pridmore and Carr-Hill 2010).

Particularly relevant for certain countries in Asia, finding effective ways to improve the status of women—whether through microfinance directed to women, cash transfers conditional on girls attending school, increasing female representation in government, and/or support for reproductive health and family planning (King et al. 2008)—will be essential for reducing malnutrition. Supporting and cultivating monitoring and evaluation efforts as well as increasing public spending for nutrition and health have also been identified as key actions for supporting reductions in malnutrition (Ruel 2008).

Despite the challenges to reducing malnutrition, examples of effective action in reducing malnutrition exist. At the national level, Thailand has been seen as an example of a country that effectively reduced malnutrition through coordinated, multisectoral efforts led with strong nutrition governance while Vietnam has seen rapid and dramatic reductions in childhood stunting (see **Boxes 4** and **5** for a description of the factors credited for success in Thailand and Vietnam).

At a programmatic level, USAID Title II development food assistance programs, which employ a multisectoral approach to reduce malnutrition and improve food security (through activities in agriculture; maternal and child health and nutrition; water, sanitation and hygiene; and nonagricultural income generation; among others), have been shown to be effective as a whole to reduce child malnutrition, improve some indicators of maternal and child health and nutrition, and increase household access to income and food (van Haeften et al. 2013) (see **Box 6** for “lessons learned” from Title II development

food assistance programs in terms of improving nutrition outcomes). **Box 7** describes the experience of Title II development food assistance programs in Bangladesh and the successful strategies they used to achieve their outcomes. Bangladesh is one of the few country examples where technical sector interventions were evaluated in an integrated manner.

At the global level, the Scaling Up Nutrition (SUN) movement was launched in 2010 with a framework for scaling up nutrition presented at the World Bank and International Monetary Fund annual meetings, followed by a roadmap presented at the United Nations General Assembly. SUN has since evolved into a movement of countries, development partners, international organizations, civil society groups, and businesses, all committed to (1) creating an enabling political environment for country-led scaling up of nutrition involving multiple stakeholders, (2) establishing best practices for scaling up proven interventions, (3) aligning actions around high quality and well-costed country plans, and (4) increasing resources to coherent aligned approaches (Secretariat of the SUN Movement 2012). As of January 2014, over 100 organizations and 45 countries have committed to the SUN movement, including 10 countries in Asia, 3 of which are included in this report (Bangladesh, Nepal, and Tajikistan).

Box 2. Nutrition-Specific versus Nutrition-Sensitive Interventions

Nutrition-specific interventions/programs refer to the immediate, most proximate causes of maternal and child malnutrition, namely dietary intake, feeding and caregiving practices, and infectious disease burden. Interventions that would be considered “nutrition-specific” include maternal dietary or micronutrient supplementation, promotion of breastfeeding and optimal complementary feeding practices, dietary diversification and micronutrient supplementation for children, fortification, treatment of severe acute malnutrition, and disease prevention and management.

Nutrition-sensitive interventions/programs address the underlying causes of maternal and child malnutrition—such as food security and access to health services and resources at the maternal, household, and community levels for caregiving—and include specific nutrition goals and actions. Examples of nutrition-sensitive interventions or programs include agriculture and food security programs; social safety nets; early child development; women’s empowerment; schooling; water, hygiene, and sanitation; and health and family planning services.

Adapted from Ruel et al. 2013

Box 3. Good Nutrition Governance: What is Needed?

The Institute of Development Studies carried out a six-country assessment in 2011–2012 to compare the “formulation and implementation of government nutrition strategies” across Bangladesh, India, Peru, Zambia, Brazil, and Ethiopia (Mejia Acosta and Fanzo 2012)—countries which had all scored “medium” or “strong” on nutrition governance in a previous assessment by WHO in 2009 (Engesveen et al. 2009). The study found three aspects as key to good nutrition governance: capability to coordinate actions across multiple sectors and government sectors; accountability to the demands of civil society and other stakeholders to take action to address malnutrition; and responsiveness to ensure that the “window of opportunity” during the first 1,000 days to prevent malnutrition is not missed. In addition, the key findings and policy recommendations as they relate to “how government works best to improve nutrition outcomes” (Mejia Acosta and Fanzo 2012) are as follows:

1. **The executive branch of government should be directly involved in malnutrition reduction policies at the presidential or prime ministerial level.** This helps to raise public awareness, coordinate efforts of different government sectors, and protect funding allocations.
2. **Establish effective bodies to coordinate nutrition actions across government ministries.** These bodies can facilitate effective funding allocations, monitor progress, and facilitate decision making among other stakeholders. Coordination bodies need to have strong political support and appropriate funding sources.
3. **Frame nutrition as an integral part of the national development agenda.** A high public profile for nutrition can create greater public awareness and concern and is most effective when nutrition is seen as part of a broader development agenda.
4. **Develop a single narrative about the severity of malnutrition.** This can help to set clear policy goals.
5. **Ensure that local governments have the capacity to deliver nutrition services.** Adequate decentralized structures help to deliver nutrition services at the local level.
6. **Encourage local ownership of nutrition programs and their outcomes.**
7. **Support civil society groups to develop social accountability mechanisms.**
8. **Collect nutrition outcome data at regular intervals, especially in highly dynamic and fragile contexts.** Lack of accurate and timely nutrition data can impede formulation of nutrition strategies.
9. **Use centralized funding mechanisms to generate greater incentives to cooperate in the design, implementation, and monitoring of nutrition interventions.**
10. **Governments should create financial mechanisms to protect (earmark) nutrition funding and use it in a transparent way.**

Box 4. Malnutrition Reduction in Thailand: Factors for Success

Thailand is frequently cited as a success story in reducing malnutrition, both in Asia and globally. The prevalence of underweight among children under 5 was reduced from 25% in 1986 to 15% in 1995, a rate of 1.1 percentage points per year which is double what has been seen elsewhere due to general development. While some of the factors contributing to Thailand's success (outlined below) may be replicable in other countries, one of the primary lessons learned from Thailand's experience was that identifying strategies that fit Thailand's particular political, cultural, and administrative environment was crucial. Some of the reasons for Thailand's success in tackling malnutrition (which mirror many of the conclusions in **Box 3** on good nutrition governance) include:

- Government commitment to a national nutrition program and multisectoral poverty alleviation strategies
- Creating a national consensus that investing in nutrition was important to building the country's future and communicating this to all levels of society
- Multisectoral holistic approach to addressing malnutrition involving the health, education, and agricultural sectors, and particularly close integration of nutrition within health
- Targeting the most-vulnerable population groups and regions (provinces) of the country to ensure the best use of resources
- Building community involvement, empowerment, and self-reliance to establish the idea that "nutrition was a family and community responsibility not just the Government's" through:
 - The use of community volunteers on a large scale
 - Community involvement in program planning and implementation
 - An assessment and monitoring approach—"Basic Minimum Needs" that prioritized nutrition among its indicators—which served as a tool for communities to collect their own data, conduct their own needs assessment, and identify their development priorities, and also provided results at the community level
 - Local financing mechanisms (which also increased sustainability)
- Managing the nutrition sector through multiple committees, rather than one agency, which increased "buy-in" from multiple stakeholders to the importance of nutrition

Sources: Heaver and Kachondam 2002; Ruel 2008; Tontisirin and Bhattacharjee 2001

Box 5. Reducing Stunting in Vietnam: Factors for Success

Vietnam has seen dramatic declines in childhood stunting unlike many of the other countries in the region. The stunting prevalence of children under 5 has steadily fallen from 43% in 2000 to 36% in 2006, and finally to 23% in 2011. Understanding some of the reasons why Vietnam has been so successful in reducing under-5 stunting levels may provide some key insights for other countries around the region.

The lack of change in infant and young child feeding (IYCF) indicators (i.e., exclusive breastfeeding has remained constantly low at around 17% for the last 10 years) indicate that the improvement in stunting may come more from improvements in water and sanitation, agricultural growth, and a strong health system. Access to safe drinking water in Vietnam increased from 79% in 2000 to 92% in 2011 while the percent of households using “improved/not shared” toilet/latrines rose from 44% in 2000 to 74% in 2011. Diarrhea prevalence among children under 5 years fell from 11% in 2000 to 7% in 2011; the lowest prevalence in the region. In addition to improved water and sanitation, Vietnam has seen some of the highest rates of agricultural growth in the world (between 1990 and 2010) at 4% per year. However, this high rate of growth in agriculture is not necessarily linked to a reduction in stunting as Tanzania has seen similar growth (3.8%) over the same time period and has not seen the same reduction in stunting. In Vietnam, increased yields led to a demand for more jobs and a majority of small landholders saw increased yields and profits (factors not present in Tanzania), thus indicating that the *type* of agricultural growth may be an important factor as well. Lastly, Vietnam has seen continued improvements in their health system, as 92.4% of women gave birth in a health facility in 2011 compared to 63.8% in 2006, which illustrates the high levels at which women and children are able to access health care.

Vietnam’s success illustrates the impact that nutrition-sensitive interventions, such as improved water and sanitation, access to more and diversified foods from increased agricultural outputs, and increased access to health services, can have on reducing stunting. Vietnam’s success also indicates that rapid change is possible by addressing both the basic and underlying causes of malnutrition. However, this is still only the first step for Vietnam as the stunting prevalence is still very high among ethnic minorities (41% in 2011) and still affects one in five children across the country. In addition, an examination of the stunting prevalence by age indicates that stunting is highest among children 24–35 months and continuously higher in children above the age of 2 than below. Thus, in order for Vietnam to continue its impressive reduction in under-5 stunting, addressing key nutrition issues such as the extremely low levels of optimal IYCF practices and potential causes of stunting among older children, such as poor dietary diversity and feeding frequency, is critical. In an effort to address some of these concerns, the Government of Vietnam has amended the labor code to allow mothers 6 months of maternity leave, expanded the ban on the advertisement on breast milk substitutes, and created a revised National Infant and Young Child Feeding Action Plan.

Sources: Vietnam Multiple Indicator Cluster Survey’s from 2000, 2006, and 2011; Food and Agriculture Organization of the United Nations (FAO) et al. 2012

Box 6. Lessons Learned from USAID Title II Development Food Assistance Programs

The *Second Food Aid and Food Security Assessment* evaluated changes in and accomplishments of Title II development food aid (non-emergency) programs between 2003 and 2009. In total, 101 programs in 28 countries were reviewed including 64 programs in 20 countries in Africa, 14 programs in 3 countries in Asia, and 23 programs in 5 countries in Latin America and the Caribbean. These programs implemented interventions in a wide-range of sectors to address food insecurity and malnutrition, including: agriculture and natural resource management (AG/NRM); maternal and child health and nutrition (MCHN); vulnerable group feeding; HIV; education; water, sanitation, and hygiene; non-agriculture income generation; infrastructure; and emergency preparedness and disaster management.

Overall, the assessment showed that:

- **Stunting in children under 5 fell on average 1.32 percentage points per year and underweight fell by 0.63 percentage points per year with delivery of MCHN services in Title II programs.** These rates exceeded the secular trends in undernutrition reduction in many of the same countries (based on Demographic and Health Surveys [DHS]).
- More than three-quarters of the programs reporting on household diets and incomes found improvements, including improvements in the months of adequate household food provisions and improvements in markers of household dietary diversity.

Evidence for the effectiveness of integrating interventions across different technical sectors (e.g., AG/NRM and MCHN) is slim however, as few programs reviewed in the assessment measured such effects (e.g., impact on beneficiaries receiving both AG/NRM and MCHN programming). One evaluation that did look at the integrated effects of multiple sectors was in Bangladesh (see **Box 7**).

Recommendations for MCHN programming based on findings from projects that saw greater improvements in nutrition include:

- Targeting women and children in the first 1,000 days from pregnancy to 2 years of age, focusing on prevention
- Providing most or all of the Essential Nutrition Actions (ENA) as well as preventive and curative health services
- Coordinating with child health days to ensure greater coverage of health and nutrition services
- Improving complementary feeding practices; strategies included prioritizing improving complementary feeding, behavior change with the right message to the right person at the right time based on formative research on maternal dietary and infant and young child feeding (IYCF) practices, and counseling home visits to improve IYCF
- Preventive, conditional supplementary feeding as an essential intervention; programs that provided MCHN preventive supplementary feeding achieved an average annual reduction in stunting of 1.69 percentage points, a decline three times greater than the DHS secular changes and double that achieved in recuperative feeding only or no food ration programs

Recommendations for AG/NRM programming based on findings from projects that saw greater improvements in agricultural and income-generating activities include:

- Implementing market-oriented programs that focus on linking producers to more promising, higher-value markets in combination and simultaneously with the introduction of new technologies and technical assistance
- Focusing agricultural interventions on farmers that are “vulnerable and viable” and looking for other options involving the creation of off-farm jobs, for example, for those clients in their target areas that do not fall into this category
- Recognizing the importance of integration, for example, linking programs to increase overall household incomes with community-based MCHN programs that deliver the ENA in the first 1,000 days and increase access to improved water, sanitation, and health services.

Sources: van Haeften et al. 2013

Box 7. Integration of USAID Title II Development Food Assistance Program Interventions: Examples from Bangladesh

Between 2004 and 2010, two Title II development food assistance programs were carried out in Bangladesh: SHOUHARDO (Strengthening Household Abilities for Responding to Development Opportunities, implemented by CARE) and Jibon o Jibika (“Life and Livelihood,” implemented by Save the Children). Unique to the evaluation of these programs was their ability to show the integrated effects of efforts by multiple sectors on child nutrition outcomes.

SHOUHARDO

In terms of overall program impact, the final evaluation found that, **“the more involved a household has been in multiple SHOUHARDO interventions, the better off it is in terms of food security, equality of power between female and male household members, and the nutritional status of young children.”**

- A 16 percentage point reduction in stunting and a 12 percentage point reduction in underweight were achieved through a combination of direct food assistance; interventions to improve the economic conditions of children’s households; support for providing clean water supplies; and health, hygiene, and nutrition support to mothers. Key interventions associated with improved nutritional status included:
 - Food assistance to children 6–24 months and lactating women
 - Participation in “Core Occupational Groups” designed to improve a household’s economic security, particularly participation in groups supporting vegetable and fruit production which increased dietary diversity of women and children
 - Assistance with tubewells (for access to safe water) and increased access to latrines

- “Courtyard sessions” and growth monitoring which had positive impacts on mother’s caring practices and their own antenatal care, including better feeding and care practices during instances of diarrhea, greater use of iron-folate supplementation, and greater utilization of health services for immunizations
- Participation in more project interventions (such as comprehensive homestead development and agricultural activities, as well as receipt of behavior change messages promoting vegetable and fruit consumption) was associated with greater household food security as measured by months of access to sufficient food (increased from 5.2 to 7.5) and dietary diversity (increased by 16%).
- Empowerment of women as shown by their decision-making power was increased by participation in “Empowerment, Knowledge and Transformative Action groups” and other SHOUHARDO groups as well as interventions designed to improve a household’s economic security

Jibon o Jibika

In terms of overall program impact, the final evaluation found that Jibon o Jibika achieved most of its nutritional goals in the 70 program unions in which household food production and marketing activities to increase food access and maternal and child health and nutrition (MCHN)/ water, sanitation, and hygiene (WASH) activities to improve food utilization targeted a common group of beneficiaries, while the nutritional gains in program unions without household food production and marketing activities were minimal. In other words, among beneficiaries, **“food accessibility and availability at the household level are as important as the proper utilization of food to improving the nutritional status of children.”**

- A 6.3 percentage point reduction in stunting was achieved in program areas in which both food production/marketing and MCHN/WASH interventions were implemented. There was no overall decrease in stunting in areas in which only MCHN/WASH was implemented.
- Household food security increased as measured through an increase in the household dietary diversity score, although only in unions where food production/marketing activities were implemented, and there was a decrease in households categorized as severely food insecure.

Sources: TANGO International Inc. 2009a and 2009b.

U.S. Government Efforts to Reduce Malnutrition and USAID’s Investments in Nutrition in Asia

The 1,000 Days Partnership is a USG lead global partnership that seeks to promote targeted action and investment to improve nutrition for mothers and young children during the 1,000 days from pregnancy to age 2. The USG also supports the Scaling Up Nutrition (SUN) movement, which seeks to bring increased political attention and action to the issue of nutrition. In addition, the USG is addressing nutrition through its Feed the Future initiative. This initiative supports country-led programs to address the root causes of malnutrition using a multisectoral approach to create synergies across health, agriculture, and social protection sectors. Agriculture is central to improvements in nutrition, income, and the status of women by increasing the availability (and hopefully the nutritional quality) of food, providing a source of income

(for women farmers in particular), as well as empowerment of women which will translate to gains in child nutrition and health (Ruel 2008).

Of the countries discussed in this report, Bangladesh, Tajikistan, and Nepal are Feed the Future focus countries and Bangladesh and Nepal have global health programs. These country initiatives address the root causes of malnutrition, as discussed previously, and both have specific malnutrition reduction targets. However, from a review of USAID funding obligations for fiscal year 2013, only two of the four countries examined in this report have funds specifically dedicated (and specifically tracked) to address malnutrition (Bangladesh and Nepal). Although investments in other areas of health—for example infectious disease or family planning—will have indirect impact on malnutrition, the absence of funds focusing on nutrition-specific interventions in particular will impede progress in reaching malnutrition targets, particularly in South Asia where the global burden of malnutrition is most highly concentrated. Even with substantive investments in nutrition-sensitive activities, clear and direct nutrition-specific approaches and activities are needed to achieve the targets set for improved nutrition outcomes.

3 Nutritional Status in Bangladesh, India, Nepal, and Tajikistan

This section describes the main forms of malnutrition present among women and children in Bangladesh, India, Nepal, and Tajikistan. Comparisons are made across countries and trends are provided within countries (more detailed data for each country are available in the nutrition profiles). The most recent nationally-representative data was used as the source for country data, unless noted otherwise. These sources are: Bangladesh 2011 Demographic and Health Survey (DHS), India 2005–2006 DHS, Nepal 2011 DHS, and Tajikistan 2012 DHS.⁴

Summary

In the three South Asian countries examined (Bangladesh, India, and Nepal) efforts to reduce malnutrition should utilize a life cycle approach to address malnutrition at the earliest stages. Significantly greater attention and support is needed to improve nutrition of women of reproductive age with a strong emphasis on nutrition of adolescents, among whom malnutrition is more pronounced and consequences more severe. Attention should be paid to delaying the age of marriage and first pregnancy, ensuring evidence-based nutrition interventions are implemented during pregnancy (such as those that support adequate prenatal care, multiple micronutrient [including calcium] supplementation, and adequate weight gain), and reducing perinatal mortality by providing skilled care at delivery.

In South Asia as well as Tajikistan, continued (and strengthened) long-term, multifaceted efforts to reduce levels of stunting need to be accompanied by activities to address stagnant levels of wasting, particularly among children under 12 months of age (and in some countries under 6 months of age). These activities include improving infant and young child feeding practices, addressing underlying and basic determinants of disease (vaccination coverage; water, sanitation, and hygiene; health-seeking behaviors; and malaria prevention efforts), and ensuring structures for community-based management of acute malnutrition are in place.

Anemia is a particularly critical nutritional concern in South Asia and Tajikistan. A multifaceted, preventive life cycle approach is needed to address anemia and its multiple causes prior to pregnancy, during pregnancy, and during the first 2 years of life, with parallel social behavior change communication about anemia and its causes and consequences.

Nutrition governance in South Asia could be strengthened through improved multisectoral coordination for nutrition, greater high-level executive leadership to address nutrition, a shared vision of how to address malnutrition, improving monitoring and evaluation efforts, and addressing capacity to deliver nutrition services. In Tajikistan, salt iodization efforts (including monitoring and enforcement) as well as efforts to increase awareness about the importance of iodine for health and nutrition are needed.

⁴ Data sources used for each country and for trend data are listed at the end of this report in the Primary Country Data Sources section.

Low Birth Weight and Child Malnutrition

- LBW has been declining in recent years in Bangladesh and India, but still affects 1 in 5 children in Bangladesh and 1 in 4 children in India. In contrast, LBW affects 12% of children in Nepal and 7% of children in Tajikistan.
- Prevalence of underweight and stunting among children under 5 has decreased at greater rates in Bangladesh and Nepal in the last decade (between 1 and 1.5 percentage points per year) than in India (around 0.5 and 0.6 percentage points per year). These countries, however, still represent some of the highest levels of malnutrition in Asia.
- Prevalence of wasting has largely not changed in recent years in the three South Asian countries examined.

Maternal Nutrition

- Underweight among women has been decreasing at the greatest rate in Bangladesh, followed by Nepal.
- Underweight is higher among adolescent women (15–19 years of age), women in rural areas, and women of lower wealth quintiles and with lower levels of education in Bangladesh, India, and Nepal.
- Overweight and obesity among women of reproductive age have been on the increase in all three South Asian countries in recent years, almost doubling in Bangladesh between 2004 and 2011 (from 9 to 17%), increasing 4 percentage points in India between 1999 and 2006, and 4 percentage points in Nepal between 2006 and 2011. In Tajikistan, 30% of women of reproductive age are either overweight or obese.
- Short stature affects 12 to 13% of women of reproductive age in Bangladesh, India, and Nepal and has overall been decreasing in South Asia, although at slower rates than underweight.

Micronutrient Status

- Anemia prevalence is alarmingly high, affecting approximately 70 to 80% of children under 2 and 35 to 56% of women of reproductive age in the three South Asian countries, as progress has been slow to address this condition. Tajikistan has lower levels of anemia (roughly half of children under 2 and a quarter of women of reproductive age) and has seen significant reductions in recent years.
- Vitamin A deficiency is still a concern in the region, particularly in India where 52% of preschool children are estimated to be deficient.
- The prevalence of iodine deficiency has decreased significantly in the South Asian countries in the last two decades. In contrast, in Tajikistan, more than half of children under 5 and women of reproductive age have inadequate iodine intake, with little progress made in recent years.

Low Birth Weight, Under-5 Mortality, Stunting, Underweight, and Wasting Among Children

Rates of LBW remain very high in South and Central Asia. According to national estimates, rates of LBW have declined in Bangladesh (from 30% in 1998 to 22% in 2006) but have remained mostly stagnant in India (from 30% in 1999 to 22% in 2006) and Nepal (14% in 2006 to 12% in 2011). LBW is estimated to account for 7% of births in Tajikistan, as of 2012. Trends in LBW should be interpreted with caution due to under registration of births and recording of birth weights.

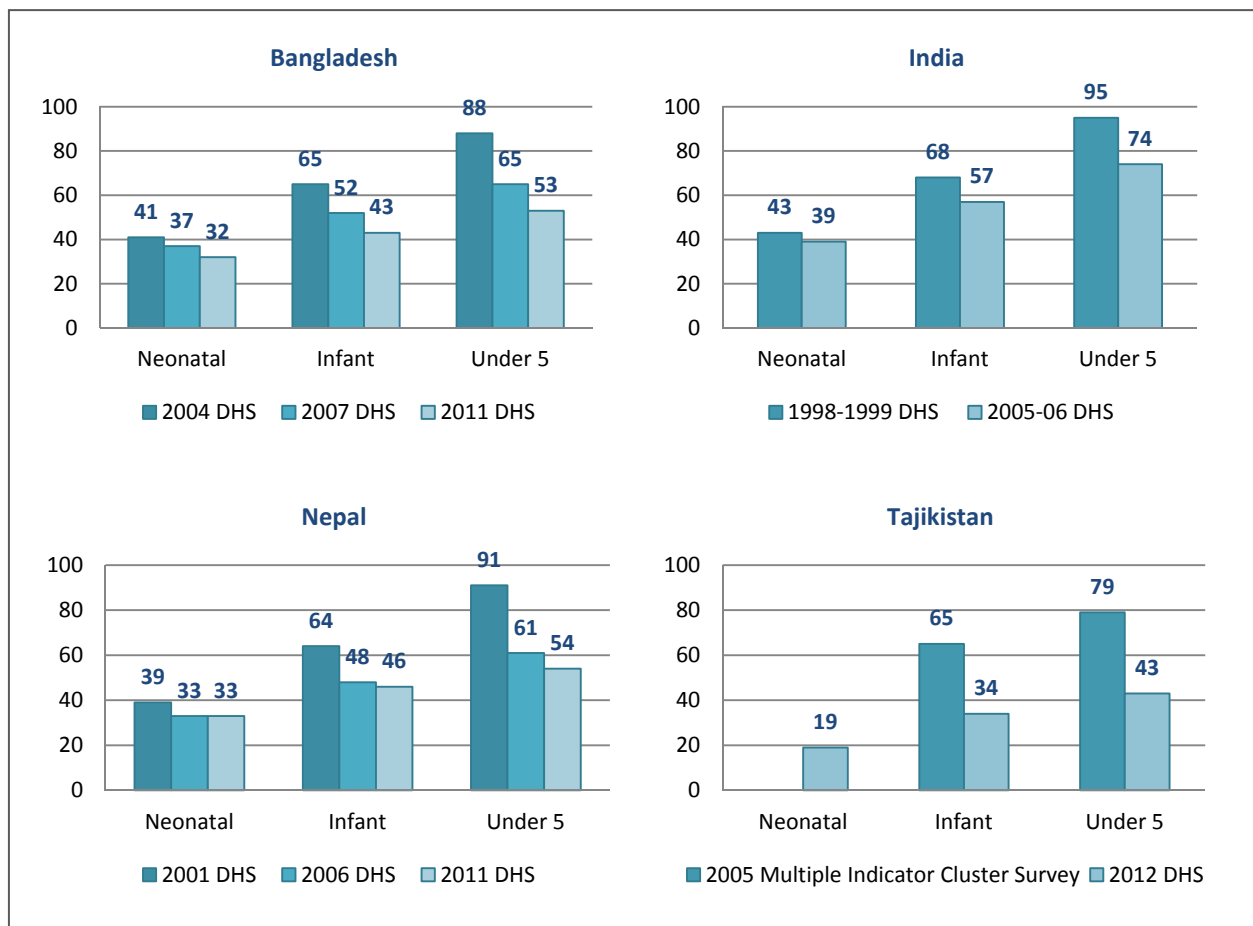
Although under-5 mortality has decreased in South Asia overall in the last several years, progress has been slowest on reducing neonatal mortality, which currently constitutes nearly three-quarters of the infant mortality rate in Bangladesh and Nepal, over two-thirds in India, and slightly over half in Tajikistan (see **Figure 2**). Fetal growth restriction contributing to LBW is associated with greater mortality during the neonatal period (particularly if the infant is also premature) and is estimated to contribute to 12% of under-5 mortality (Black et al. 2013). Thus, reducing levels of LBW is fundamental to reducing mortality levels, particularly in the neonatal period.

Underweight and stunting among children under 5 have also declined throughout Asia—including in Bangladesh, India, and Nepal (see **Figures 3 and 4**)—although prevalence of stunting and underweight still remain the highest in South Asia among different regions in Asia (United Nations System Standing Committee on Nutrition [UNSCN] 2010). In the three South Asian countries examined, more than 40% of children under 5 years of age are stunted (see **Figure 4** and **Table 1**).⁵ In Tajikistan, stunting has declined while the prevalence of underweight has stayed relatively stable since 2005. In general, across the three South Asian countries examined, higher stunting prevalence is associated with smaller birth size, lower maternal education (see **Figure 6**), lower wealth status, and rural residence. Across all three South Asian countries children in the lowest wealth quintile are more likely to be stunted with at least a 28 percentage point difference between the lowest and highest wealth quintiles. Although stunting is still higher among the poor in Tajikistan, wealth does not appear to be as large of an underlying factor as it is in South Asia (see **Figure 7**). Across the three South Asian countries there is no clear pattern of gender differences in stunting, wasting, and underweight, and disparities are generally small. In Bangladesh stunting is slightly more frequent among female children (42%) than male children (41%), in India the proportions are equal (48%), and in Nepal, male children tend to be more likely to be stunted than females (41% versus 40%, respectively). In contrast, boys are more likely to be wasted in all three countries, although only by 1–2 percentage points. In Tajikistan, male children are slightly less likely than female children to be stunted (26% versus 27%) but are essentially equally affected by wasting and underweight.

The prevalence of wasting has largely stayed the same in the last few decades in Bangladesh and Nepal. India has the highest rates of wasting (more than 1 in 5 children under 3 as of 2006), and there has been an uptick in wasting in India (from 1999 to 2006) and Tajikistan (from 2005 to 2012) (see **Figure 5**). India, due to its immense population size has the greatest number of children affected by stunting and wasting, nearly 57.9 million stunted and 23.9 million wasted (see **Table 1**). **Appendix 2** provides data on the prevalence of stunting and wasting among children under 2 years of age.

⁵ Trend data for India are provided for children under 3 rather than under 5 as surveys prior to 2005–2006 did not include the entire under-5 age group.

Figure 2. Neonatal, Infant, and Under-5 Mortality Rates (per 1,000 Live Births) in Bangladesh, India, Nepal, and Tajikistan



Note: Data are for the time period within the previous 5 years of the survey.

Figure 3. Trends in the Proportion (%) of Children Under 5 Who are Underweight*

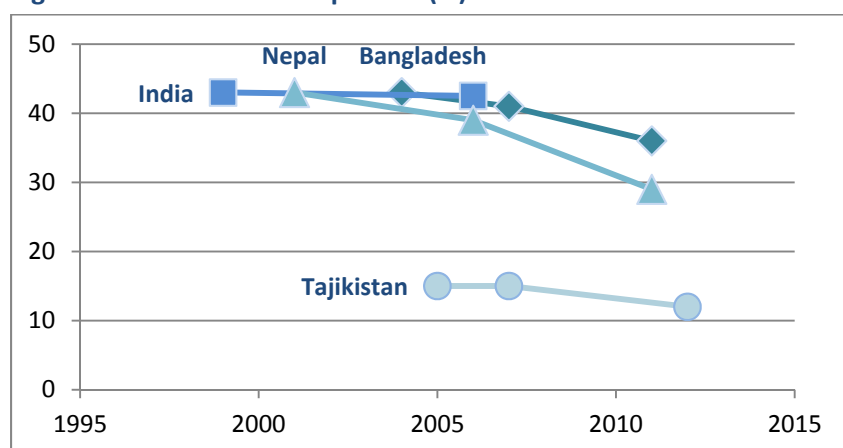


Figure 4. Trends in the Proportion (%) of Children Under 5 Who are Stunted*

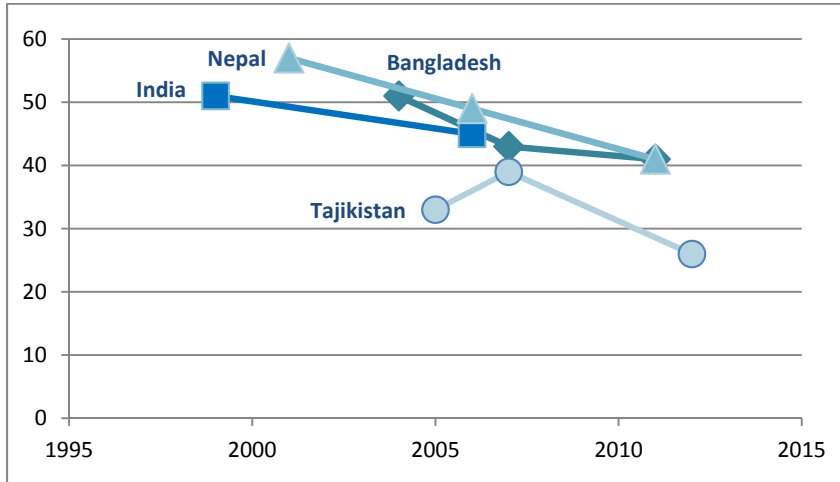
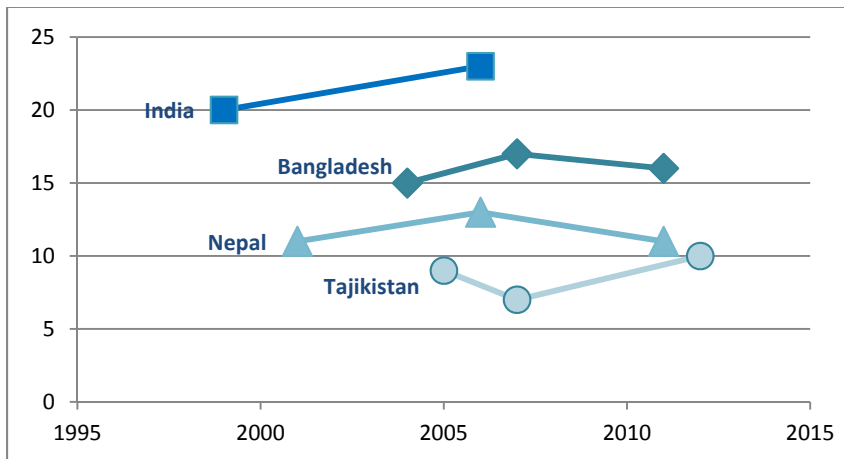


Figure 5. Trends in the Proportion (%) of Children Under 5 Who are Wasted*



* Figures 3–5: Trend data for India represent prevalence among children under 3. Trends use repeated nationally-representative DHS data, except for Tajikistan data, which reflect three different surveys: 2005 Multiple Indicator Cluster Survey, 2007 Tajikistan living standards measurement survey, and 2012 DHS, and should be interpreted with caution).

Figure 6. Stunting (%) Among Children Under 5 by Maternal Education Levels

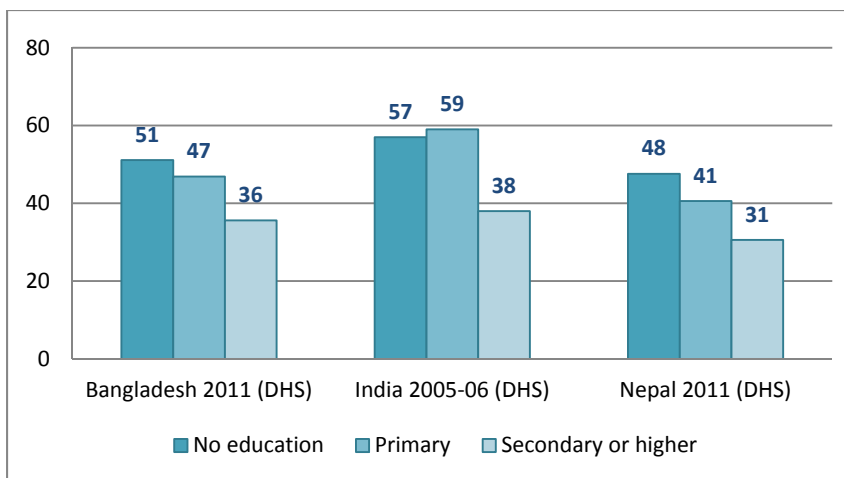
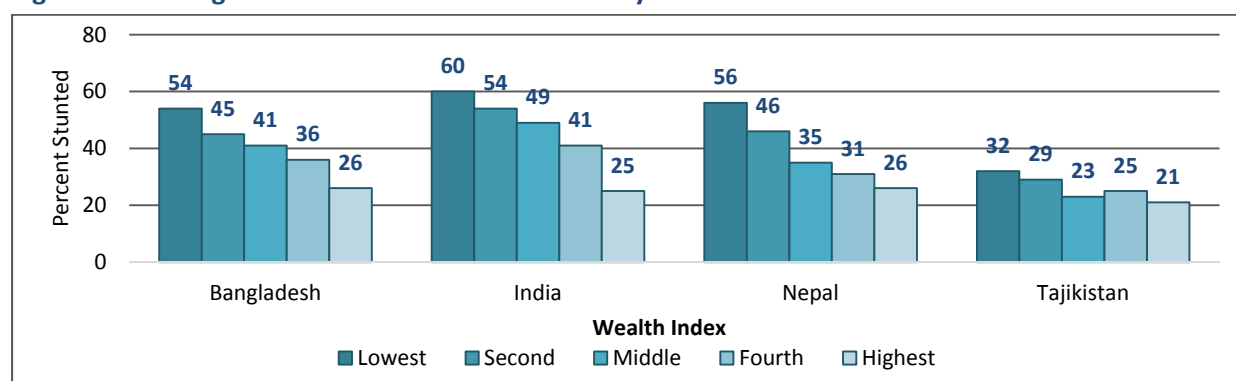


Figure 7. Stunting Prevalence of Children Under 5 by Wealth Index**Table 1. Number of Children Under 5 Affected by Malnutrition in South and Central Asia**

	Bangladesh (2011)		India (2005–2006)		Nepal (2011)		Tajikistan (2012)	
Under-5 population (2012)*	15,073,800		120,580,900		2,984,100		1,150,400	
	%	Total	%	Total	%	Total	%	Total
Underweight	36.4	5,486,863	42.5	51,246,883	28.8	859,421	12.1	139,198
Moderate	26.0	3,919,188	26.7	32,195,100	21.1	629,645	8.4	96,634
Severe	10.4	1,567,675	15.8	19,051,782	7.7	229,776	3.7	42,565
Stunting	41.3	6,225,479	48.0	57,878,832	40.5	1,208,561	26.2	301,405
Moderate	26.0	3,919,188	24.3	29,301,159	24.3	725,136	16.5	189,816
Severe	15.3	2,306,291	23.7	28,577,673	16.2	483,424	9.7	111,589
Wasting	15.6	2,351,513	19.8	23,875,018	10.9	325,267	9.9	113,890
Moderate	11.6	1,748,561	13.4	16,157,841	8.3	247,680	6.0	69,024
Severe	4.0	602,952	6.4	7,717,178	2.6	77,587	3.9	44,866

* Under-5 population 2012 estimates from www.unicef.org/infobycountry/.

Maternal Underweight, Short Stature, and Overweight/Obesity

Maternal undernutrition, as measured by low BMI and short stature, remains high across Bangladesh, India, and Nepal despite decreases in recent years. Short stature has been decreasing in all three South Asian countries over the past two decades (see **Figure 8**) and underweight as well, although progress is slowest in India where underweight among women of reproductive age decreased from 36 to 33% from 1999 to 2006 (see **Figure 9**). Among women of reproductive age, adolescents (15–19 years of age) have the highest prevalence of underweight and women over 35 have the highest prevalence of short stature (likely due to the declining prevalence of short stature over time) (see **Figures 10 and 11**).

At the other end of the nutrition spectrum, overweight and obesity, although still at relatively low numbers in South Asia compared to other regions of the world, is a growing cause for concern among women of reproductive age (see **Figure 12**) as the trend has gone upwards in Bangladesh, India, and Nepal in the last three consecutive surveys. In Tajikistan, overweight and obesity among women of

reproductive age should already be a cause for concern as 30% of women of reproductive age are affected and 59% of women 41–49 years of age. A key point to remember is that malnutrition in early life (including fetal growth restriction) contributes to both chronic stunting and overweight/obesity in adulthood (Black et al. 2013). Research indicates that coexistence of these conditions is largely due to increases in overweight among women (due to decreased physical activity and consumption of more energy-dense, but not necessarily nutrient-rich, foods such as fatty meat, refined carbohydrates, and fried foods, which are said to characterize the Tajik diet [Samah Rabie et al. 2012]) against a backdrop of static stunting levels among children (Dieffenbach and Stein 2012).

Groups particularly affected by overweight and obesity across the four countries include older women (particularly women in the 40–49 year age group, see **Figure 12**), women living in urban areas, women who are well educated, women in households in the highest wealth quintile, or women of particular ethnic/religious groups (e.g., Sikhs in India). In South Asia, Bangladesh has a much higher percentage (11%) of adolescents who are overweight or obese in contrast to Nepal and India, where the prevalence of overweight and obesity among adolescents is between 2 and 3%.

Figure 8. Trends in Prevalence (%) of Short Stature (Height < 145 cm) Among Women of Reproductive Age*

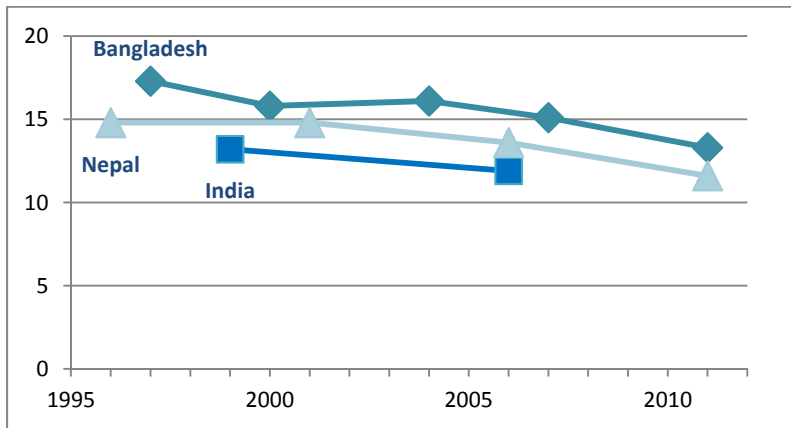
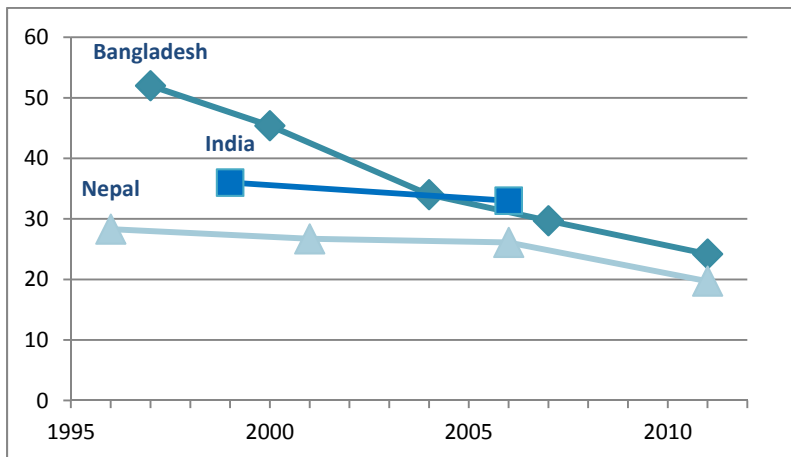
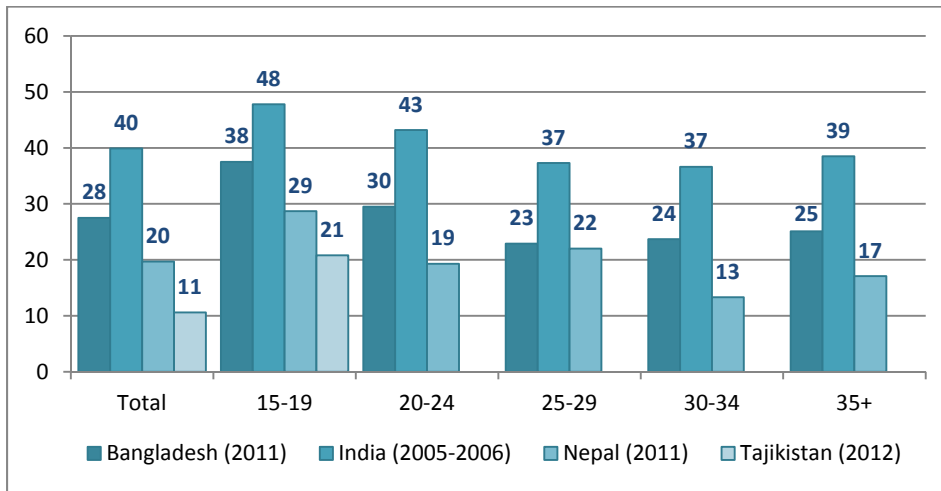


Figure 9. Trends in Prevalence (%) of Underweight (BMI < 18.5) Among Women of Reproductive Age*



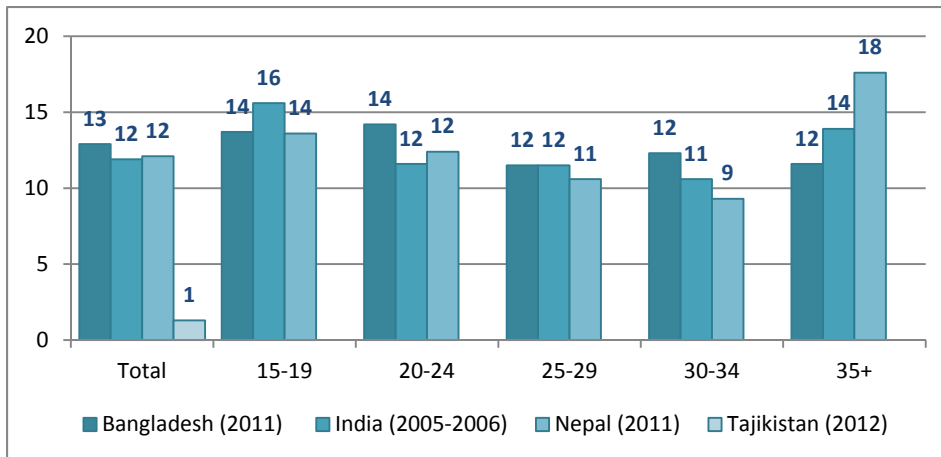
* Figures 8 and 9 represent trends among women of reproductive age (15–49 years) with live birth in the past 3 years in Bangladesh, India, and Nepal from repeated nationally-representative DHS data. Data from Bangladesh and India refer only to “ever-married” women. Data may differ from elsewhere in the report where data on all women 15–49 were used. No trend data on maternal nutritional status were available for Tajikistan.

Figure 10. Prevalence (%) of Underweight (BMI < 18.5) Among Women of Reproductive Age by Age Group*

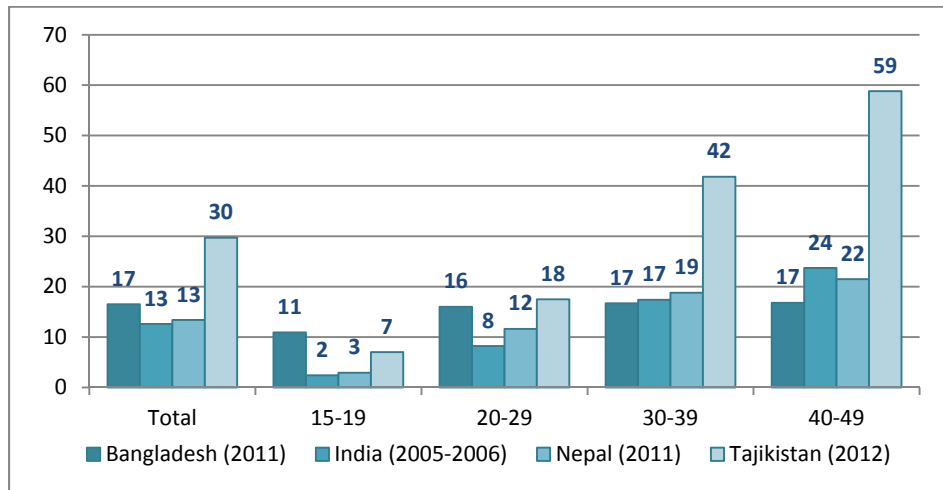


* Women of reproductive age (15–49 years) with live birth in the past 3 years. Data for Bangladesh and India refer only to “ever-married” women. Data may differ from elsewhere in the report where data on all women 15–49 were used. Data from Tajikistan were disaggregated by different age categories so only the prevalence for all women and adolescents (15–19) are shown in the figure; prevalence among women 20–29 years is 12%; 30–39 years is 6%; and 40–49 years is 3%.

Figure 11. Prevalence (%) of Short Stature (Height < 145 cm) Among Women of Reproductive Age*



* Women of reproductive age (15–49 years) with live birth in the past 3 years (data from Bangladesh and India refer only to “ever-married” women). Data from Tajikistan are for all women 15–49 years, and were disaggregated by different age categories so only the total is shown in the figure; prevalence for women 15–19 years is 3%, 20–29 years is 1%, 30–39 years is 1%, and 40–49 years is 1%.

Figure 12. Prevalence (%) of Overweight and Obesity (BMI > 25) among Women of Reproductive Age*


* Women of reproductive age (15–49 years) with live birth in the past 3 years. Data from Bangladesh refer only to “ever-married” women.

Anemia

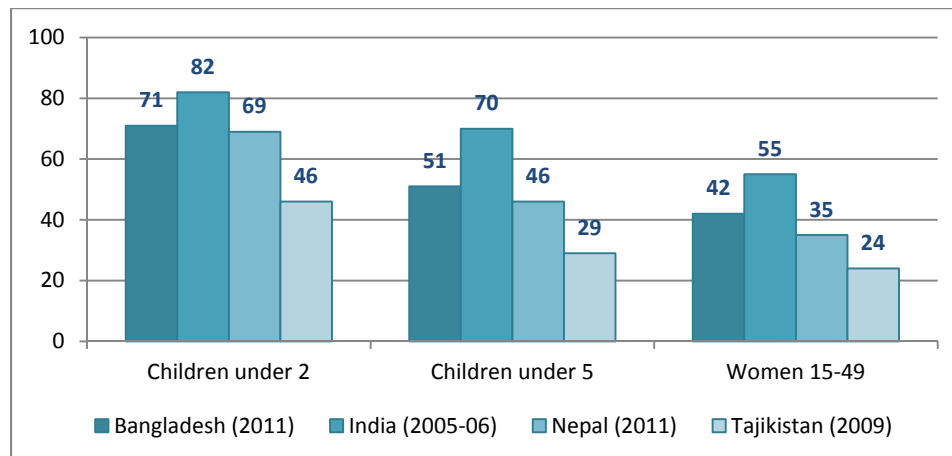
Anemia among women and children is an extremely concerning problem in the South Asian countries examined. Not only are the levels of anemia observed among women and young children very high (affecting roughly 70 to 80% of children under 2 and between one-third and one-half of women of reproductive age in these three countries, see **Figure 13**), but there has been slow progress in reducing the prevalence of this condition.

Anemia in women is associated with greater maternal morbidity and mortality, as well as poor birth outcomes, including prematurity and LBW and worsened iron status of offspring. In South Asia anemia is estimated to be the second leading cause of maternal mortality (Kahn 2006). In Asia overall, prevalence has remained relatively the same over the past few decades, which is also the case in other developing world regions (UNSCN 2010). Among women of reproductive age in India, rates of anemia among “ever married” women increased 4 percentage points between the last two national surveys (1999 and 2006). In Bangladesh trends in anemia prevalence are difficult to discern due to different data sources and populations studied. The 2011 DHS estimated that nationally roughly 50% of pregnant women were anemic and data from 2004, which focused on rural areas of the country, estimated that 39% of pregnant women were anemic (Helen Keller International 2006). Among non-pregnant/non-lactating women, a micronutrient status survey conducted in 2011 estimated that 26% were anemic (icddr,b et al. 2013). In Nepal there was a 1 percentage point reduction in anemia between 2006 and 2011, although Nepal experienced significant reductions in anemia between 1998 and 2006, reducing anemia from 68 to 36% nationally among women of reproductive age (Pokharel et al. 2011). In Tajikistan levels of maternal anemia are lower than the South Asian countries, affecting roughly a quarter (24%) of women of reproductive age in 2009, down from 42% in 2003 (Ministry of Health [MOH] and UNICEF 2010). Within each South Asian country there are country-specific variations in the distribution of anemia by region or ecological zone, but across the three, prevalence of anemia among women tends to be higher among pregnant and lactating women, those with a greater number of births, those with lower levels of education (except for in Nepal where this association is not as evident), and those in lower wealth quintiles (again with the exception of Nepal, where anemia tends to be spread fairly equally across wealth quintiles).

Anemia in children is a serious cause for concern as it can negatively and irreversibly affect cognitive, motor and behavioral development with long-term implications for learning, academic achievement, and earnings. Among children under 5, anemia prevalence is the highest among children 6–23 months of age at least partly due to high iron requirements during this time (see **Figure 13**). The overwhelming majority of children in this age group in the South Asian countries examined are anemic and only examining the prevalence of anemia among children under 5 will underestimate the true magnitude of the problem. Progress has been mixed in reducing anemia among children in the four countries. In India, the prevalence of anemia among children 6–35 months worsened between 1999 and 2006—from 74 to 79% of children. Nepal experienced a 2 percentage point reduction in anemia between 2006 and 2011 (from 48 to 46% of children under 5). In Bangladesh, trends are harder to discern due to data from different surveys that focused on slightly different populations. Tajikistan has lower levels of anemia among children than in South Asia and levels are declining; approximately 29% of children under 5 are affected as of 2009 compared to 38% in 2003 (MOH and UNICEF 2010). Although living in an urban area and having a non-anemic mother or a mother with higher education levels or of greater wealth tended to convey a lower risk of anemia in South Asia, the prevalence of anemia in even these “better-off” groups was still quite high. As an example, among children (6–59 months of age) in the highest wealth quintile in India, 56% of them are anemic (compared to 76% in the lowest wealth quintile).

Nationally-representative data on iron deficiency and iron deficiency anemia specifically are not common. In Bangladesh, a survey of children under 2 years of age in the Monohardi subdistrict found that 50% of children with anemia were also iron deficient (icddr,b 2010). The Bangladesh National Micronutrients Status Survey 2011–2012 found that 33% of children under 5 had anemia, but only 7% had both iron deficiency and anemia (icddr,b et al. 2013). These data indicate that iron deficiency is the cause of anemia in roughly 1 in 5 children. Tajikistan’s 2009 micronutrient status survey estimated that iron deficiency is the cause of approximately 30% of moderate and severe anemia cases among children in the country and is the cause of 42% of moderate and severe anemia cases among women (MOH and UNICEF 2010). Thus, while iron deficiency is a primary cause of anemia, it is important to be aware of and address other causes of anemia (both nutritional and non-nutritional) (see **Box 8**).

Figure 13. Prevalence (%) of Anemia Among Children Under 2 Years, Children Under 5 Years, and Women of Reproductive Age*



* Anemia is defined as Hb < 11 g/dL for children and pregnant women; Hb < 12 g/dL for non-pregnant women.

Note: Tajikistan data is from the 2009 micronutrient status survey (MOH and UNICEF 2010). Bangladesh data was only collected for “ever-married” women 15–49 years of age. The Bangladesh National Micronutrients Status Survey 2011-12 reported that 33% of children 6–59 months of age were anemic and reported that 26% of non-pregnant/non-lactating women were anemic (icddr,b et al. 2013).

Box 8. Iron Deficiency and Anemia

Although anemia is frequently interpreted as “iron deficiency anemia,” it is very important to recognize that not all anemia is due to lack of iron. Most national surveys do not specifically measure markers of iron status along with hemoglobin. Low hemoglobin can be caused by iron deficiency and is indeed a primary cause of anemia particularly in infants and young children, as well as pregnant women, due to particularly high iron needs during these periods of rapid growth and development. However, other nutrient deficiencies, such as vitamin A, B12, B6, folic acid, and to a lesser extent vitamin C and copper can also play a role in the etiology of anemia. Infection, including malaria, parasites such as hookworm which cause blood loss, and general inflammation caused by infection, can also contribute to anemia. Low birth weight, a particular concern in Asia, contributes to low iron stores at birth, which are a primary source of iron for growth during the first half of infancy. Another potential cause of anemia in the South Asian context, particularly Bangladesh, is arsenic contamination. Thus anemia levels should serve as an indication that iron deficiency is of concern, but as not all anemia is caused by iron deficiency, they should not be seen as one and the same. As an example, research in Bangladesh in children under 2 has shown that between 20 to 50% of anemia cases are due to iron deficiency (icddr,b 2010; icddr,b et al. 2013). These data indicate that many anemia cases in this age group will not be solved by improvements in iron intake alone. At a regional level, analysis of South Central Asia and Southeast Asia data estimate that around 20% of children under 5 and pregnant women have anemia that would be ameliorated by iron supplements (Black et al. 2013).

Micronutrient Deficiencies: Vitamin A and Iodine

Vitamin A deficiency in children and adults can cause vision damage (including blindness) as well as increase morbidity and mortality due to infectious diseases. Vitamin A deficiency can be measured through clinical signs, which are only visible in severe deficiency and generally affect the eye (e.g., night blindness, “Bitot’s spots” which are a buildup of keratin on the conjunctiva of the eye, or xerophthalmia which is characterized by dryness and wrinkling of the cornea that can lead to blindness). It can also be assessed through measuring serum retinol in the blood to determine the level of “subclinical” vitamin A deficiency,⁶ where vitamin A is inadequate, but not inadequate enough to produce clinical signs. The prevalence of severe deficiency, as measured by clinical signs of deficiency such as xerophthalmia, declined in two of the three South Asian countries examined, decreasing from 4.5% to 0.5% between 1983 and 1999 in Bangladesh and 1.0% to 0.6% between 1981 and 1998 in Nepal (UNSCN 2010). In India, progress was not as evident as the prevalence of severe vitamin A deficiency stayed roughly the same from 1.4% to 1.7% between 1988 and 2001 (UNSCN 2010). Generally, levels of severe deficiency greater than 0.5% are concerning.

As for “subclinical” levels of vitamin A deficiency, according to the UNSCN 2010 *6th Report on the World Nutrition Situation*,⁷ in Asia overall, vitamin A deficiency among children has been declining, although not at a rate that would meet the MDG of cutting in half the proportion of children suffering

⁶ Subclinical vitamin A deficiency is generally defined as serum retinol < 20 ug/dL, and is commonly what is referred to as vitamin A deficiency.

⁷ DHS and Multiple Indicator Cluster Surveys do not assess micronutrient status directly, but may collect information on indicators of clinical deficiency (for those micronutrients with easily detectable clinical signs, e.g., night blindness for vitamin A deficiency) or intake (e.g., percentage consuming vitamin A-rich or iron-rich food in the past 24 hours or use of iodized salt at the household level).

from this condition by 2015. In India, Nepal, and Tajikistan estimates of vitamin A deficiency in preschool-age children were placed at 52%, 25%, and 40% respectively as of 2007 (UNSCN 2010). Data from the 2011–2012 National Micronutrients Status Survey in Bangladesh indicate that 21% of preschool and school-age children are vitamin A deficient (icddr,b et al. 2013). By WHO guidelines for classifying the public health significance of vitamin A deficiency, vitamin A deficiency among preschool children in all four countries would be of “severe” public health significance (> 20%) (WHO 2009), although India and Tajikistan clearly exceed the cut-off more so than Bangladesh and Nepal.

Vitamin A deficiency among women of reproductive age, and pregnant women in particular, is a concern. The prevalence of vitamin A deficiency in pregnant women is likely lower than in preschool children, although this may be due to a relative lack of data (WHO 2009). A 2009 analysis by WHO on vitamin A deficiency between 1995 and 2005 estimated that in all three South Asian countries night blindness during pregnancy was still of public health significance (> 5%) and that “subclinical” deficiency among pregnant women was of moderate public health significance in India and Tajikistan (between 10 and 20%) and of severe public health significance in Bangladesh and Nepal (> 20%). In India, the most recent national survey data (2005–2006) showed that 9% of pregnant women reported suffering from night blindness, a condition caused by chronic vitamin A deficiency. In Bangladesh, 5% of non-pregnant/non-lactating women are vitamin-A deficient (icddr,b et al. 2013).

Iodine deficiency during pregnancy and early life causes mental retardation as well as stunted growth and impaired development, which are largely irreversible. In children and adults, iodine deficiency impairs thyroid function causing goiters and also affects intellectual ability and educational achievement. The prevalence of goiters (which reflect long-term iodine deficiency) in Nepal decreased from 55 to 40% between 1960 and 1998, and low urinary iodine excretion (which reflects shorter-term intake and deficiency) decreased from 35 to 27% between 1998 and 2005 (UNSCN 2010). The median urinary iodine concentration in Nepal for school-age children is 188 ug/L, which is in the optimal range. The Bangladesh National Micronutrients Status Survey conducted in 2011–2012 found that 40% of children were iodine deficient (urinary iodine concentration [UIC] less than 100 ug/L), however, the median UIC was 145.7 ug/L, indicating optimal iodine status in this population according to WHO criteria (icddr,b et al. 2013). Among non-pregnant/non-lactating women, 42% had a UIC less than 100 ug/L and the median UIC was 122.6 ug/L (icddr,b et al. 2013). There are no nationally representative data available for India, although data compiled from local surveys (between 1993 and 2006) estimate that 31% of school-age children have low UIC and the median UIC is 133 ug/L (WHO 2007). In contrast, in Tajikistan, a micronutrient survey conducted in 2009 found that 59% of women and 53% of children under 5 had a UIC less than 100 ug/L, staying roughly the same since 2003 (MOH and UNICEF 2010).⁸

⁸ There are conflicting data presented in the 2009 National Micronutrient Status report for Tajikistan. The median UIC value presented is 116 ug/L for children 6–59 months of age and 108 ug/L for women of reproductive age. At the same time however, the report states that more than 50% of children and women (53% and 59%, respectively) had a UIC less than 100 ug/L. Thus, by the median UIC value, iodine nutrition would be considered adequate, although the percentage of individuals with low urinary iodine excretion seems to suggest potentially low iodine intake.

4 Potential Causes of Malnutrition in Bangladesh, India, Nepal, and Tajikistan

As discussed previously, the causes of malnutrition are many and interrelated. While individual countries will have specific causes (which are highlighted in each country nutrition profile), these countries also share characteristics that have been shown to be associated with malnutrition among women and children, which are discussed in this section.

Summary

Immediate Causes

- Dietary diversity among women is low, particularly for iron-rich foods.
- Exclusive breastfeeding duration is lower than optimal, although overall breastfeeding length is long. The percent of infants 0–5 months exclusively breastfed is lowest in Tajikistan (34%) and highest in Nepal (70%).
- Complementary diets do not meet minimum standards for dietary diversity and feeding frequency for most breastfed children under 2 years of age in all three South Asian countries as well as in Tajikistan. The proportion of breastfed children with “minimum acceptable diets” is lowest in Tajikistan (17%) and highest in Nepal (25%).
- In all three South Asian countries iron supplement use (either in tablet, powder, or syrup form) is very low among young children and also low among pregnant women, particularly in Bangladesh and India. Nepal has the highest levels of iron supplement use during pregnancy and vitamin A supplement use postpartum.
- Adequately iodized salt reaches the majority of households in Bangladesh and Nepal and reaches less than half of households in India and Tajikistan.
- Prevalence of fever in the 2 weeks preceding the survey among children under 5 years was highest in Bangladesh (37%) of the three South Asian countries, and prevalence of diarrhea was highest in Nepal (14%). In Tajikistan, prevalence of diarrhea was 15%.
- Deworming medication use is low among children under 2 (which are a lower risk age group than school-age children). Of the three South Asian countries examined, Nepal reported the highest percentage (55%) of pregnant women receiving deworming medication in the 6 months prior to the survey.

Underlying Causes

- Access to an improved water source was close to universal in Bangladesh, India, and Nepal, but appropriate treatment methods for drinking water were lacking, particularly in Bangladesh. Approximately 76% of households in Tajikistan had access to an improved water source and 85% used an appropriate water treatment method.

- About a third of households in Bangladesh and Nepal have access to an improved and not shared toilet/latrine. In contrast, such facilities are nearly universal (94%) in Tajikistan.
- A quarter of households in Bangladesh, nearly half of households in Nepal, and more than three-quarters of households in Tajikistan had soap and water for handwashing.

Basic Causes

- Maternal education and empowerment are low in the three South Asian countries examined, with India having the most extreme gender inequity of the three.
- Early marriage and childbearing, although improving in recent years, remain common in South Asia, and are particularly evident in Bangladesh.
- Despite success in reducing poverty in all three South Asian countries, these gains have not been universally seen within the countries and malnutrition still disproportionately affects those in the lowest wealth quintile.

Immediate Causes

Dietary intake (including supplements and fortified food). Both dietary quantity and quality are of concern in South Asia. Traditionally vegetarian diets, low intake of iron-rich food (particularly meat), high intake of inhibitors of iron and other mineral absorption, and low dietary diversity are considered prime contributors to micronutrient deficiencies and anemia. In India, less than 7% of women consume fish, chicken, or meat on a daily basis and only about a third (35%) do so on a weekly basis. Survey data shows that approximately half of children under 2 years of age in Bangladesh (54%) consumed an iron-rich food in the 24 hours prior to the survey, compared to 11 and 24% of Indian and Nepali children, respectively. Consumption of vitamin A-rich food fared slightly better with 64%, 38%, and 47% of children 6–23 months of age in Bangladesh, India, and Nepal, respectively, consuming a vitamin-A rich food in the past 24 hours. Approximately 27% of women of reproductive age in Tajikistan consumed meat, chicken, or fish in the past 24 hours (MOH and UNICEF 2010).

Supplements are one way to increase the intake of particular nutrients that are either needed in greater quantities (e.g., iron during pregnancy) and are difficult to obtain from the diet, the two most commonly provided being vitamin A and iron/folic acid. Bangladesh, India, and Nepal recommend iron and folate supplementation for young children and pregnant women (generally 90–100 days of iron supplementation starting in the second trimester and continuing for a period after delivery). However, in these three countries iron supplement use is low. Among children 6–59 months, receipt of iron supplements (either in tablet, powder, or syrup form) in the week prior to the survey ranged from a low of 2% in Bangladesh to a high of 5% in India. Among women, iron supplement use was better, but still not at adequate levels. Of women with a birth in the last 5 years, 23% and 56% took at least 90 days of iron supplements in their last pregnancy in India and Nepal, respectively (the most recent DHS in Bangladesh did not report data on iron supplementation use among pregnant women, despite national recommendations on iron supplement use for this group).

Fortification is a more passive way to increase the intake of a specific nutrient, the most common and the most successful example being iodization of salt. Most DHS surveys collect information on the presence or use of iodized salt at the household level, the primary source of iodine in many countries. All three of the South Asian countries included in this report have legislation that requires mandatory salt iodization (Begin and Codling 2013). In the three South Asian countries examined, 81%, 48%, and 73% of children

6–59 months of age (and similar percentages of women of reproductive age) in Bangladesh, India, and Nepal, respectively, were living in households with adequately iodized salt. In India, there was wide variation in the adequacy of salt iodization by state, reflecting differences in the scale of salt production, transportation requirements, enforcement efforts, differences in state regulations, the pricing structure, and storage patterns. In Tajikistan, while 83% of households have iodized salt, only 39% of tested households had salt that was fortified with iodine at recommended levels.

Infant feeding practices. Breastfeeding and complementary feeding practices are strong determinants of child malnutrition levels. While the duration of breastfeeding is typically very long in South Asia (between 2 and 3 years), the median duration of exclusive breastfeeding falls short of the recommended 6 months in all three South Asian countries. The proportion of infants between 0–5 months of age who are exclusively breastfed is lowest in India of the South Asian countries (46%), and Tajikistan’s levels of exclusive breastfeeding are even lower (34%) (see **Figure 14**). Early initiation of breastfeeding (within the first hour of life) is also quite low in South Asia, ranging from 25% in India to 47% in Bangladesh. India has particularly delayed initiation of breastfeeding, with just over half of infants beginning breastfeeding in the first day of life. Delayed initiation of breastfeeding is associated with significantly greater neonatal mortality and morbidity.

Between a half and two-thirds of children begin to receive solid/semi-solid food at the appropriate age in the three South Asian countries, although the diet they receive is very low in diversity and in most cases not provided frequently enough (see **Figure 15**). Less than a quarter of children 6–23 months in all four countries meet minimum standards for acceptable diet.

Figure 14. Breastfeeding Practices (%)

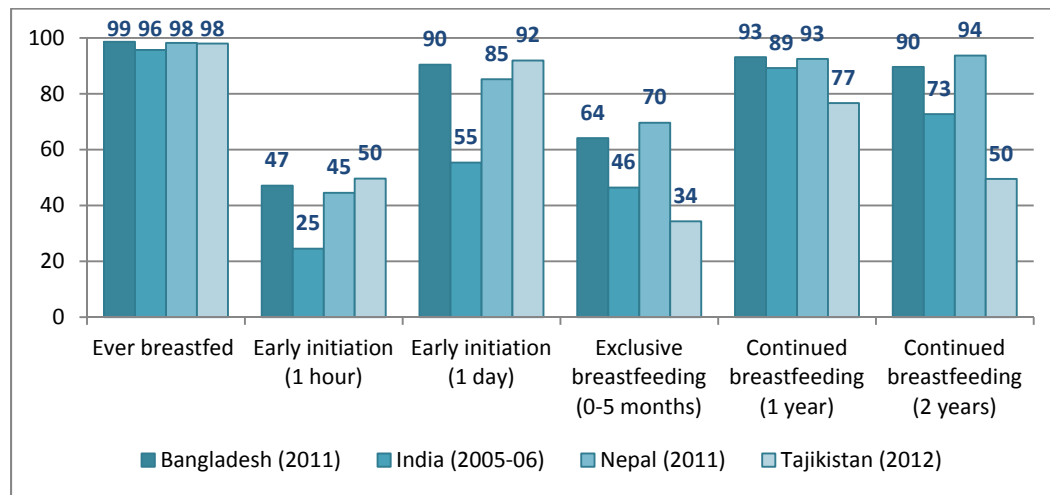
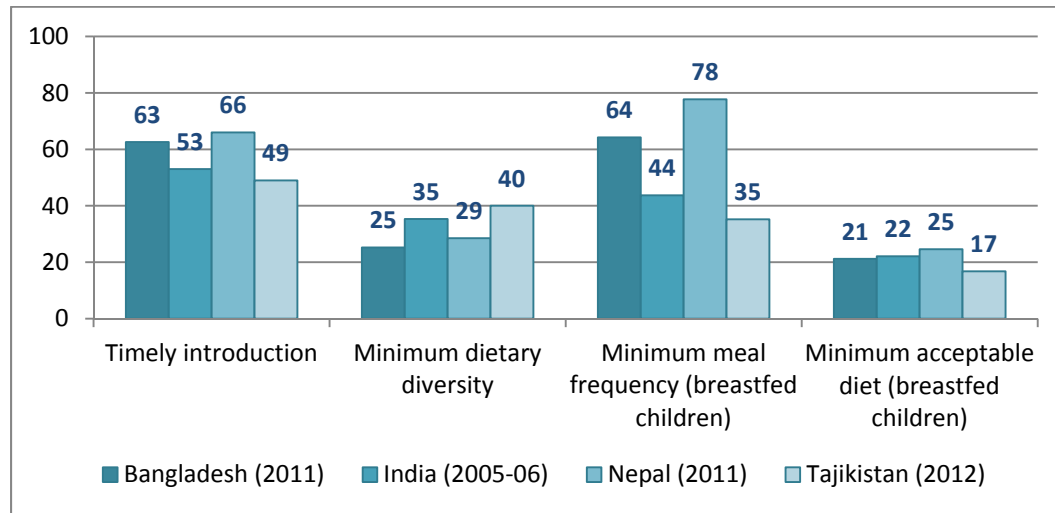


Figure 15. Complementary Feeding Practices of Children 6–23 Months (%)

Disease. Vaccination coverage is lowest in India, where only about a third of children have received basic vaccinations by 12 months of age. In contrast, 4 out of 5 children have received basic vaccinations by 12 months of age in Bangladesh and Nepal and by 18 months in Tajikistan. Intestinal helminths (including hookworm, roundworm, and whipworm) can contribute to iron deficiency and anemia in developing countries and are endemic in the South Asian region. In Bangladesh, India, and Nepal more than two-thirds of children 1–14 years live in areas where these parasites are intensively transmitted, and are in need of treatment and preventive interventions (WHO 2011). Intestinal parasite infection increases with age, although children as young as 6 months can become infected. The three South Asian countries exhibit wide variation in the use of deworming medication for intestinal parasites among children under 2 years of age—8% of children 6–23 months in India, 21% of children 6–23 months in Bangladesh, and 74% of children 12–23 months in Nepal had taken deworming medication in the 6 months prior to the survey. Generally, deworming medication use increases with age, so the lower rates of use among children under 2 years could be due to a lower perceived risk or need for medication at younger ages. Use of deworming medication among children 6–59 months was 50% in Bangladesh, 84% in Nepal, and only 12% in India. In Tajikistan, where it is estimated that between one- to two-thirds of children 1–14 years of age are in need of treatment, 50% of children 6–59 months of age had taken deworming medication in the 6 months prior to the survey in 2009. Among women who had a child in the past 5 years, 55% in Nepal took deworming medication during their pregnancy whereas only 4% did so in India (Bangladesh did not collect this data in the most recent DHS conducted in 2011).

Malaria, diarrhea, fever, and ARIs are also important illnesses to note due to their effects on nutrition among women and children, as well as their contributions to child mortality (pneumonia and diarrhea are leading causes of child death in the South Asian region). The bottom half of **Table 2** (at the end of this section) presents the prevalence of infection among children under 5 in the 2 weeks prior to the survey. Fever is most commonly reported in Bangladesh, whereas diarrhea is most common in Nepal and Tajikistan. Malaria incidence has been decreasing in Bangladesh, India, and Nepal, with Nepal decreasing case incidence by 75% between 2000 and 2011, Bangladesh on track to reduce malaria incidence by 75% by 2015, and India on track with a 50–75% reduction by 2015. Tajikistan is already classified as in the “elimination” stage of malaria infection with only 53 indigenous cases reported in 2011 and 62% of the population living in malaria-free areas of the country.

Underlying Causes

Food security. In Bangladesh roughly 35% of women of reproductive age were classified as suffering from some degree of food insecurity in the most recent DHS (2011), with a slightly higher percentage of rural women (39%) falling into the same category, and a much higher percentage of women in the lowest wealth quintile (65%). In Bangladesh, and likely South Asia in general, female-headed households are much more food-insecure than male-headed households (WFP Bangladesh 2012). In Nepal, roughly half of all households (51%) are considered food insecure.

Tajikistan is rated as the most food insecure of the former Soviet republics (Samah Rabie et al. 2012). Estimates from 2011–2013 on the proportion undernourished in Tajikistan indicate that 30% of individuals are not meeting minimum energy requirements (see **Table 3**) and analyses using the Tajikistan Living Standards Survey 2007 produced similarly high estimates (34%) (Ministry of Agriculture et al. 2011). Despite greater incomes in urban areas, food insecurity is more severe and widespread there than in rural areas, likely due to greater susceptibility to food and fuel shocks in these populations (ibid). The severity of food insecurity in Tajikistan is striking given the estimated prevalence of overweight and obesity among women of reproductive age, which is also 30% as of 2012. It is possible that these two indicators are capturing different populations. Limited dietary diversity has also been identified for a segment of the population (approximately 22% of households have poor or borderline food consumption scores measuring dietary diversity) who subsist largely on cereals and tubers, which may provide adequate, but nutrient-poor calories. Although not always consistent, and less studied in developing countries, a positive relationship between food insecurity and overweight/obesity particularly among women has been demonstrated in developed countries (Larson and Story 2011).

Water, hygiene, and sanitation. **Table 3** presents information on each country's access to clean water, use of appropriate water treatment methods for drinking water, and access to hygienic latrine/toilets. While the proportion of the population in each country using an improved water source is high in all three South Asian countries, the use of an appropriate water treatment method for drinking water is comparatively low. Access to an improved/not shared toilet or latrine is available to less than half the population in the three South Asian countries. In Tajikistan, although overall improved water source access is lower than in the South Asian countries, more households use an appropriate water treatment method (85%) than in the three countries in South Asia, and access to an improved/not shared toilet/latrine is almost universal. The most recent DHS for Bangladesh (2011), Nepal (2011), and Tajikistan (2012) reported that 25%, 48%, and 79% of households, respectively, were observed to have had soap and water available for handwashing.

Basic Causes

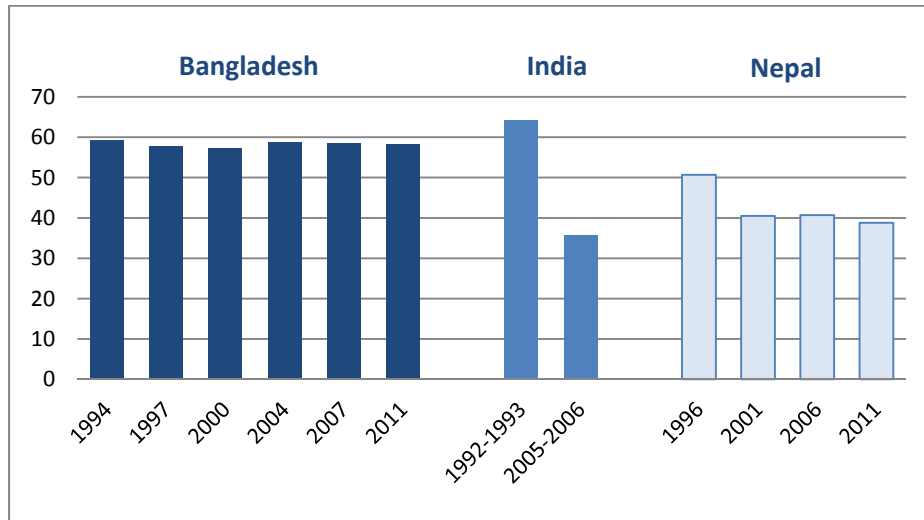
Maternal health, education, and social status. As previously discussed, the status and empowerment of women, their education levels, and their access to health services are strong determinants of not only their own nutritional status but also that of their children. Gender inequality is pervasive in South Asia, with India being the most extreme case of the three countries in this report, followed by Bangladesh and Nepal. Indicators of empowerment of women follow the same pattern, with the exception of decision-making authority over their own health care, of which Bangladeshi women have the least control. Education levels of women are low in South Asia—40% of women in India and Nepal have no education, followed by 28% in Bangladesh. This is in striking contrast to the education levels of women in Tajikistan, where 81% of women have some/completed secondary education and some indicators of gender inequality are also not as extreme (see **Tables 2 and 3**). Access to and/or utilization of health services among pregnant women is also strikingly different between the South Asian countries

and Tajikistan, with the prevalence of antenatal care, health facility use for delivery, and skilled attendance at delivery much higher in Tajikistan.

Poverty. Tajikistan has the greatest percent of the population living below the national poverty line at around 47%, although only about 7% of its populace lives below US\$1.25 per day as compared to 43% in Bangladesh. Although the national poverty line data are not comparable (the indicator differs between countries), Tajikistan reports a much higher percentage than its South Asian neighbors where the percent living below the national poverty line ranges from 32% in Bangladesh to 22% in India (see **Table 3**). None of the South or Central Asian countries examined in this review have met the Millennium Development Goal of halving the proportion of people whose income is less than a dollar a day, however all four are likely to meet that goal by 2015.⁹

Early marriage and childbearing. In the three South Asian countries, women in Bangladesh marry at the youngest ages (median age is approximately 16 years) (see **Table 2**). Over half of women in Bangladesh have begun childbearing by 19 years of age (with little change over the past 20 years) compared to 36% of women in India and 39% of women in Nepal (see **Figure 16**). Trends in adolescent fertility show that reductions in all three South Asian countries have been quite slow (see **Figure 17**). Pregnancy during adolescence affects the mother’s own growth and development, and adolescent pregnancy is associated with a greater risk of LBW in the offspring. In Tajikistan, 27% of women 15–19 years begin childbearing and the median age of first pregnancy is about 22 years.

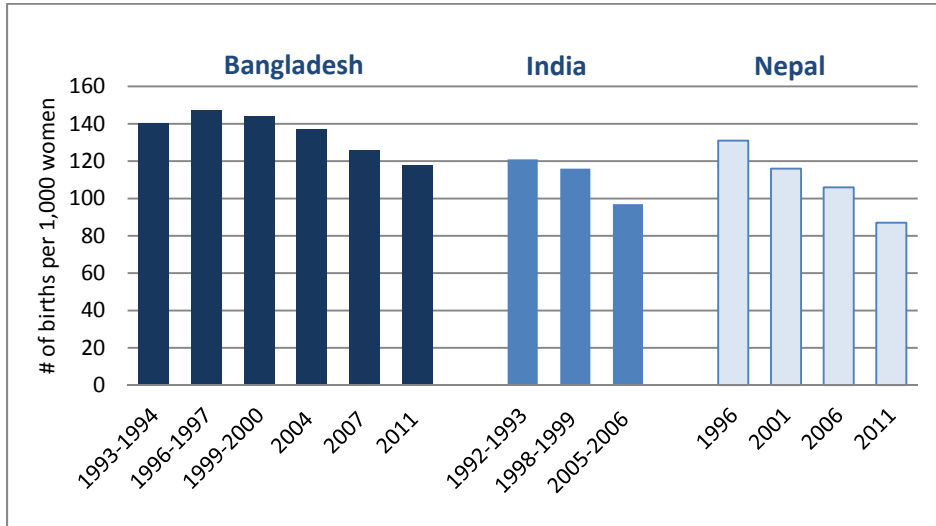
Figure 16. Trends in the Percent of Women 15–19 Years Who Have Begun Childbearing by 19*



Note: India data for 1992–93 are for the percent of women 17–19 years who began childbearing by 19.

⁹ In Tajikistan the reduction is to halve the proportion of people whose income is less than US\$2.15 per day.

Figure 17. Trends in Adolescent Fertility (Women 15–19 Years)*



* Figures 16 and 17 are from repeated nationally-representative DHS data.

Table 2. Characteristics of Women of Reproductive Age (15–49 Years) and Child Health

	Bangladesh (2011)		India (2006)		Nepal (2011)		Tajikistan (2012)	
	Women	Men	Women	Men	Women	Men	Women	Men
Education of women 15–49 years of age (highest level attained) versus men								
% with no education	27.7	26.2	40.6	18.0	39.8	13.8	2.0	N/A
% with some or completed primary education	30.0	33.3	23.1	26.7	17.4	19.7	3.8	N/A
% with some or completed secondary education	42.3	40.5	36.4	55.2	42.8	66.5	81.0	N/A
Employment and empowerment of women 15–49 years of age								
% employed in the past 12 months	15.0	99.5	42.8	87.6	60.0	77.5	27.3	
% with sole decision-making authority over their own earnings	33.6		24.4		52.6		32.7	
% with sole decision-making authority over their own health care	12.9		27.1		25.7		14.5	
Fertility								
Median age (years) at first marriage (women 20–49 years)	15.8		17.2		17.8		20.2 (women 25–49)	
Median age (years) at first birth (women 20–49 years)	18.3		20.0		20.2		21.8 (women 25–49)	
% of women 15–19 years who have begun childbearing by 19 years of age	58.3		35.7		38.8		27.1	
Total fertility rate	2.3		2.7		2.6		3.8	
Family planning, reproductive health, and maternal mortality								
% of women using a “modern” family planning method	52.1		48.5		43.2		25.8	
% of currently married women using a “traditional” family planning method	9.2		7.8		6.5		2.1	
% of women 15–49 years with live birth in the past 5 years receiving antenatal care from a “medically-trained” or “skilled” provider ¹	54.6		74.2		58.3		78.8	
% of women 15–49 years with birth in the past 5 years who delivered in a health facility ¹	28.8		38.7		35.3		76.5	
% of women 15–49 years with birth in the past 5 years who delivered with a medically-trained provider ¹	31.7		46.6		36.0		87.4	
Maternal mortality ratio (deaths/100,000 live births) (2010 estimate) ²	194		200		170		65	
Child health: vaccination, illness, utilization of health services, and mortality rates								
% of children 12–23 months with basic vaccinations by 12 months of age	82.5		36.3		80.7		84.3 ³	
% of children under 5 with symptoms of ARI in the previous 2 weeks	5.8		5.8		4.6		1.0	
% of children under 5 with symptoms of ARI in the previous 2 weeks taken to a health care provider/facility for advice/treatment	35.2		69.0		50.0		62.7	
% of children under 5 with diarrhea in the previous 2 weeks	4.6		9.0		13.8		15.0	
% of children under 5 with diarrhea taken to a health care provider/facility for advice/treatment	24.8		59.8		38.0		53.7	
% of children under 5 with a fever in the previous 2 weeks	36.5		14.9		18.7		9.0	
% of children under 5 with a fever taken to a health care provider/facility for advice/treatment	27.0		70.8		41.9		57.0	
Neonatal mortality rate (0–4 years before survey)	32		39.0		33		19	
Infant mortality rate (0–4 years before survey)	43		57.0		46		34	
Under-5 mortality rate (0–4 years before survey)	53		74.3		54		43	

¹ This indicator is in the past 3 years for Bangladesh.² Maternal mortality source for India, Nepal, and Tajikistan: UNICEF 2012; Bangladesh: BRAC 2011.³ Percent of children 18–29 months of age with basic vaccinations by 18 months of age.

Table 3. Country Characteristics

	Bangladesh	India	Nepal	Tajikistan
Population, birth, and death rates¹				
Population (July 2013 estimate)	163,654,860	1,220,800,359	30,430,267	7,910,041
% of population 0–14 years of age (2013 estimate)	33.0	28.9	32.6	33.4
% urban population (2010)	28	20	19	26
Population growth rate, % (2013 estimate)	1.59	1.28	1.81	1.79
Birth rate (per 1,000 population) (2013 estimate)	22.07	20.24	21.48	25.49
Death rate (per 1,000 population) (2013 estimate)	5.67	7.39	6.68	6.38
Economy				
Gross domestic product (current US\$) (2011) ²	111.9 billion	1.9 trillion	18.9 billion	6.5 billion
Gross domestic product per capita (current US\$) (2011) ¹	743	1,509	619	935
Health expenditures, % of GDP ¹	3.5	4.1	5.5	6.0
Education expenditures, % of GDP ¹	2.2	3.3	4.7	3.9
% of population below national poverty line (2009-2012) ³	31.5	21.9	25.2	47.2
% of population below US\$1.25 per day (2009-2010) ⁴	43.3	32.7	24.8	6.6
Purchasing power parities (PPP) conversion factor, local currency unit to international dollar ⁴	36.87	23.99	41.94	1.59
Development				
Human Development Index ⁵ (2012)	0.515	0.554	0.463	0.622
Human Development Index ranking (out of 187 countries) ⁵	146	136	157	125
Gender Inequality Index (2012) ⁶	0.518	0.610	0.485	0.338
Gender Inequality Index ranking (out of 148 countries) ⁶	111	132	102	57
Food Security				
Global Hunger Index (2013) ⁷	19.4 (serious level of hunger)	21.3 (alarming level of hunger)	21.3 (alarming level of hunger)	16.3 (serious level of hunger)
% of households with poor or limited food consumption (food insecure)	25 ⁸	No data	28 ⁹	15 ¹⁰
Proportion undernourished in total population (%) (2010-2012) ¹¹	17	18	18	32
Food supply (kcal/capita/day) (2009) ¹²	2,481	2,321	2,536	2,106
Depth of food deficit (kcal/capita/day) (2011–2013) ¹³	111	135	132	311
Dietary Diversity¹³				
% of dietary energy supply from cereals, roots, and tubers (2008–2010)	80	62	72	63
Average supply of protein from an animal source (grams/capita/day) (2008–2010)	9	11	9	12
Water, Sanitation, and Hygiene¹⁴				
% of population with access to improved drinking water sources	99	88	89	76
% of population with access to sanitation facilities	37	29	40	94
% of households using appropriate treatment method for drinking water	10	N/A	16	85

Table 3 Footnotes:

¹ Source: CIA World Factbook (<https://www.cia.gov/library/publications/the-world-factbook/index.html>)

² Source: World Bank (<http://data.worldbank.org/indicator>)

³ Source: Millennium Development Goals Indicators (<http://mdgs.un.org/unsd/mdg/Data.aspx>); data from most recent year available; data are based on country specific poverty rates and are not comparable across countries

⁴ Source: Millennium Development Goals Indicators (<http://mdgs.un.org/unsd/mdg/Data.aspx>); data are from the most recent year available

⁵ Source: UNDP's Human Development Index database (<https://data.undp.org/dataset/Human-Development-Index-HDI-value/8ruz-shxu>)

⁶ Source: UNDP's Gender Inequality Index database (<https://data.undp.org/dataset/Table-4-Gender-Inequality-Index/pq34-nwq7>)

⁷ Source: von Grebmer et al. 2013

⁸ Source: Institute of Public Health Nutrition, Ministry of Health and Family Welfare; UNICEF; and WFP. 2009.

⁹ Source: National Planning Commission Central Bureau of Statistics. In collaboration with: World Food Program, World Bank, AusAID, UNICEF. 2013.

¹⁰ Source: USAID, WFP. 2012.

¹¹ Source: FAO, WFP and IFAD. 2012

¹² Source: FAOSTAT (<http://faostat3.fao.org/faostat-gateway/go/to/browse/FB/FB/E>)

¹³ Source: FAO 2013

¹⁴ Source: Data are from most recent DHS unless otherwise indicated

5 Nutrition Priorities for Bangladesh, India, and Nepal

Priority 1: Addressing Nutrition of Women of Reproductive Age and Adolescent Girls and Low Birth Weight

In all 3 South Asian countries examined, significantly greater attention and support is needed to improve nutrition of women of reproductive age, with a strong emphasis on nutrition of adolescent girls due to high rates of early marriage and childbearing in these countries, which among other causes, contributes to high rates of LBW.

It is evident from the progression of stunting by age that chronic malnutrition has a strong prenatal component in South Asia, as does wasting—in all three countries roughly 20% of children are already stunted during the first 6 months of life. The following are effective evidence-based interventions to improve nutritional status of adolescents and women of reproductive age and improve birth weight.

- **Delaying the age of first marriage and pregnancy.** For adolescents the single-most important intervention to improve their nutritional status, as well as that of their offspring, is to delay the age of first pregnancy. Adolescent pregnancy is associated with greater risk of stillbirths, neonatal death, LBW, premature birth, and asphyxia (Bhutta et al. 2013). Finding alternative routes to the health system to improve nutritional status of adolescents—for example, through school- or community-based programs—are needed, as contact with the health system during pregnancy can be late in many countries and improving nutritional status is needed prior to conception.
- **Promoting and providing multiple micronutrient supplementation during pregnancy (including folic acid, iron, and calcium).** Education and counseling around supplementation during pregnancy should be provided to adolescent and expectant mothers and to the community as a whole to encourage supplement use. Supplementation during pregnancy is commonly underutilized (even when available) in part due to fears of large babies and thus dangerous births.
- **Promoting a balanced protein-energy supplementation during pregnancy.** Improvements in birth weight in a population can be achieved in just a few years, even in populations of small adult women, through balanced energy-protein supplements as well as provision of multiple micronutrients (UNSCN 2010).
- **Ensuring adequate weight gain and dietary intake (quantity and quality) during pregnancy.** Focusing on improving dietary quantity and quality during early pregnancy, rather than later pregnancy, will also have a greater impact on birth outcomes (UNSCN 2010).
- **Addressing nutrient deficiencies and infections during pregnancy.** Anemia among pregnant women in South Asia is staggeringly high. Understanding and addressing the root causes of anemia, which may include nutrient deficiencies in addition to iron deficiency, as well as infections such as malaria or hookworm, is crucial to reduce these numbers.
- **Ensuring access to and coverage of skilled attendance at birth (including access to facilities for emergencies).** This is essential to reduce maternal and perinatal mortality and may also help to alleviate concerns about adverse effects of supplementation on birth outcomes.
- **Ensuring delivery care practices support nutrition outcomes.** Delayed umbilical cord clamping reduces iron deficiency in infants and early initiation of breastfeeding provides a newborn's

“first vaccination” and nutrients, decreasing morbidity and mortality. Supplementation with vitamins A and K may also be a recommended component of essential newborn care.

- **Promoting gender equality and women’s empowerment.** Ultimately, the underlying causes of maternal malnutrition need to be addressed in South Asia, particularly, the low social status of women and societal norms which currently restrict women’s utilization of health services and dictate practices such as early marriage and early childbearing, household food distribution practices, and food taboos during pregnancy and lactation.

Priority 2: Addressing Wasting and Stunting Among Children

Continued (and strengthened) long-term, multifaceted efforts to reduce levels of stunting need to be accompanied by increased activities to address stagnant levels of wasting, particularly among children under 12 months (and in some cases, under 6 months) of age.

Tackling chronic and acute malnutrition have been largely dichotomized programmatically, as preventive approaches are used to reduce stunting and recuperative or therapeutic interventions are used to treat wasting, and there are multiple challenges to integration and cooperation between these services (Bergeron and Castleman 2012). However, it is likely that interventions designed to prevent stunting (e.g., improving exclusive breastfeeding practices and maternal nutrition) will also help in lowering wasting, and potentially vice versa. Looking for opportunities to link programs addressing these two forms of malnutrition—for example, linking the community-based components of programs addressing acute and chronic malnutrition (ibid)—should help to provide more comprehensive nutrition services. The following are effective interventions to address stunting and wasting during infancy and childhood.

- **Support of optimal infant and young child feeding (IYCF) practices.** Early breastfeeding practices—including early initiation, avoiding prelacteal feeds, and exclusivity—as well as timely initiation, feeding frequency, and dietary diversity of complementary feeding all need to be improved in South Asia. Increased community support including individual and group counseling and training of health workers/volunteers in IYCF practices is needed, as well as policies that protect breastfeeding (e.g., maternity leave legislation as well as enforcement of the International Code of Marketing of Breast Milk Substitutes). Education on appropriate complementary feeding practices has been shown to decrease stunting in food insecure populations, and provision of complementary foods along with education have been effective in improving height and weight in food insecure populations (Bhutta et al. 2013).
- **Disease prevention and management.** Interventions include improved vaccination coverage (particularly in India), encouraging appropriate health care-seeking behaviors for common childhood illnesses, increasing deworming of children, adequate malaria prevention efforts in transmission areas, and counseling on infant feeding during illness. Ensuring universal access to safe water, ensuring appropriate water treatment techniques, and promoting optimal handwashing behaviors are also essential actions to reduce infection and illness.
- **Micronutrient supplementation.** Even with greater dietary diversity, consumption of adequate levels of particular nutrients (e.g., iron, zinc, and calcium) is particularly difficult for young infants, warranting supplementation (or home fortification approaches such as micronutrient powders or lipid-based nutrient supplements) to prevent deficiency and promote adequate growth and development.
- **Management of moderate and severe acute malnutrition.** Community-based services to address acute malnutrition are needed. The integrated management of acute malnutrition approach, which is being implemented in Nepal and includes guidelines for treatment of children under 6

months of age, involves training health workers and community members to detect wasting using mid-upper arm circumference.

As with maternal nutrition, basic drivers of malnutrition will need to be improved to make nutrition-specific interventions most effective. In South Asia, improving the social status of women and sanitation levels (access to safe water and facilities for removing solid waste) are key determinants.

Priority 3: Addressing Micronutrient Deficiencies and Anemia

Assessing the causes of high levels of anemia among adolescents, women of reproductive age, and children and instituting a multifaceted, preventive life cycle approach to tackling anemia with parallel information, education, and communication about anemia and its causes and consequences is needed to address the alarmingly high levels of anemia among women of reproductive age and young children in South Asia, particularly children under 2. Vitamin A deficiency remains of severe public health significance in the three South Asian countries examined and warrants continued efforts to reduce this form of malnutrition. Although iodine deficiency at the national level is deemed to be adequate in India, the highly uneven coverage of households with iodized salt (ranging from 31–94%) indicates that in particular areas of the country, iodine deficiency may still be an issue

Anemia affects roughly half of women and 70–80% of children under 2 in South Asia. A recent analysis estimated that roughly 22–23% of anemia in South Central Asia would be improved by iron supplementation (Black et al. 2013), indicating that a much larger proportion of anemia has other nutritional or non-nutritional causes that are being ignored. Vitamin A deficiency also remains a critical concern in South Asia, and iodine deficiency may be a concern in parts of India. Because anemia and micronutrient deficiencies are largely “invisible,” preventive approaches are essential and greater communication on and awareness of anemia and micronutrient deficiencies and their consequences is needed to educate consumers, as well as service providers, and increase demand for and utilization of preventative and treatment services. The following are interventions to address anemia and micronutrient deficiencies.

- **Increasing sources of bioavailable micronutrients, particularly iron and vitamin A, in the diet of adolescents, women of reproductive age, and children under 2.** Dietary diversification, supplementation, and universal fortification or “home fortification” vehicles like multiple micronutrient powders or lipid-based nutrient supplements are potential ways to bring down anemia and micronutrient deficiency levels among these groups. Among women, improving preconception iron status has been shown to lower rates of LBW (Bhutta et al. 2013). Other micronutrients (such as zinc) are likely also deficient in the diets of many South Asians. Vitamin A and B vitamins (B6, B12, riboflavin, and folate) likely also play a role in the etiology of anemia, and similar approaches to increase intake (dietary diversification, supplementation, or universal/home fortification) are needed.
- **Preventing and managing infections that cause anemia through hemolysis or blood loss.** Regular deworming of pregnant women and children should reduce intestinal parasite load, blood loss, and anemia levels. Malaria control measures, including insecticide-treated bed nets and intermittent preventive treatment in pregnancy should be employed where malaria is prevalent.
- **Ensuring delivery care practices do not contribute to anemia.** Delivery care practices can also affect anemia; preventing postpartum hemorrhage will help to prevent anemia in postpartum women and delayed umbilical cord clamping will prevent anemia in infants.

- **Determining the role of other factors in anemia etiology.** Genetic hemoglobin disorders (hemoglobinopathies) could play a role in anemia levels in some countries and the extent of their contribution should be assessed. Arsenic contamination has been raised in the etiology of anemia in Bangladesh.

Priority 4: Addressing Nutrition Governance

Nutrition governance in South Asia could be strengthened through improved coordination of malnutrition reduction efforts, greater high-level executive leadership to address nutrition, creating a shared vision of what malnutrition is and how to deal with it, improving monitoring and evaluation efforts, and addressing capacity to deliver nutrition services.

Across the three countries examined, similar challenges to achieving strong nutrition governance were identified. The following are areas that need particular strengthening.

- **Improve coordination of malnutrition reduction efforts.** Bangladesh and Nepal have embraced a multisectoral approach to tackling malnutrition, however, coordination of efforts (either between different ministries tasked to deliver nutrition services or between donors and the host country governments in terms of implementation of activities) has arisen as a key challenge to overcome in both countries.
- **Increase commitment and leadership at the highest levels of government.** In Bangladesh and India, high-level executive leadership has been deemed lacking by several analyses, stymieing efforts to reduce malnutrition.
- **Create a unified vision of what malnutrition is and why it exists.** In Bangladesh and India, the need to create a coherent vision of what malnutrition is and what causes it has been raised as a reason for insufficient action on the part of policymakers and insufficient demand for action by civil society. This inaction is due to multiple and fragmented visions of what needs to be done to reduce malnutrition (e.g., seeing malnutrition as mainly a food supply/distribution problem, or seeing the solution to malnutrition as entirely through breastfeeding promotion).
- **Lack of credible data and reliance on faulty data or multiple conflicting data sources.** In India, multiple data sources (e.g., nationally-representative survey data versus program data) have caused some policymakers to deny that the problem of malnutrition exists, and in Bangladesh it prohibits shared goal setting. Recent data from Bangladesh on anemia (icddr,b et al. 2013) paint a much different picture than the most recent DHS conducted in 2011. Agreeing on data sources and recommended actions will be necessary to make progress.
- **Improve and strengthen capacity to deliver quality nutrition services.** In all three countries, particularly Bangladesh and Nepal which have undertaken national strategies to improve nutrition service delivery, issues of capacity to deliver quality nutrition services through existing health structures and staffing (through individuals who are already responsible for a wide range of health services) has been questioned, and greater training and supervision of staff is needed.

6 Nutrition Priorities for Tajikistan

Priority 1: Addressing Stunting and Wasting Among Children

Long-term, multifaceted efforts to reduce levels of stunting (taking into account underlying and basic issues of food security, IYCF, infectious disease burden, and health care seeking and utilization behaviors) need to be adopted in Tajikistan while increasing efforts to address wasting (particularly in children under 2) and remaining aware of the growing problem of overweight and obesity among women of reproductive age.

Tajikistan exemplifies a country undergoing the “nutrition transition.” Stunting among young children is still of public health significance in the country (affecting 26% of children under 5), while overweight and obesity among women of reproductive age has been on the rise, affecting nearly one-third of women of reproductive age. Wasting affects 1 in 10 children under 5, but 15% of children under 2 are wasted and the highest prevalence of wasting is among children under 6 months of age (23%). Interventions should continue to focus on prevention of malnutrition in early life, as well as prevention of overweight/obesity in adult women. The following are effective interventions to be considered.

- **Support of optimal IYCF practices.** In Tajikistan one of the primary causes of child stunting is suboptimal infant feeding practices, particularly low rates of exclusive breastfeeding, low rates of timely initiation of complementary feeding, and insufficient feeding frequency. As the majority of women deliver in health facilities in Tajikistan, a renewed emphasis on establishing, certifying, and maintaining Baby-Friendly Hospitals should help to improve breastfeeding practices.
- **Disease prevention and management.** Diarrhea, which is the single-most important disease contributor to stunting (Black et al. 2013), was higher in Tajikistan at 15% than in any of the South Asian countries examined, despite better rates of adequate sanitation facilities. Interventions to prevent diarrheal infection, such as improved handwashing, sanitation facilities, and water treatment methods, as well as management strategies, such as zinc and oral rehydration solution treatment and IYCF practices during illness, need to be particularly emphasized. The highest rates of diarrhea are among 6–23 month olds (among whom roughly a quarter were affected), indicating a need for particular attention to this group.
- **Micronutrient supplementation.** Even with greater dietary diversity, consumption of adequate levels of particular nutrients (e.g., iron, zinc, and calcium) is particularly difficult for young infants, warranting supplementation or fortification (particularly home fortification approaches such as micronutrient powders or lipid-based nutrient supplements) to prevent deficiency and promote adequate growth and development.
- **Management of moderate and severe acute malnutrition.** As the highest rates of wasting in Tajikistan are seen in children under 6 months of age (23%), treatment of wasting in this vulnerable population should be a primary focus of any intervention program designed to treat wasting. Identifying opportunities to link community outreach activities for the prevention of stunting with activities for the detection and treatment of wasting will help to provide comprehensive nutrition services in Tajikistan. Ensuring that those involved in treating wasting are well-trained in proper IYCF practices and can provide support for breastfeeding will also be essential.
- **Prevention of overweight/obesity in adult women.** While successful approaches to prevent overweight/obesity in low-income countries are few, interventions that address both diet and physical activity levels have been found to be most successful (Bhutta et al. 2013).

Priority 2: Addressing Iodine Deficiency

Strengthening the monitoring and enforcement of salt iodization and increasing awareness among policymakers on the importance of iodine for health and economic development is needed in Tajikistan.

Iodine deficiency remains a significant public health concern in Tajikistan, where 59% of women and 53% of children under 5 were estimated to have insufficient iodine. A study of several nutrition-specific interventions in Tajikistan deemed that improving salt iodization provided the greatest annual economic returns on investment (Samah Rabie et al. 2012). Results from the 2009 micronutrient survey indicate that consumers understand the importance of iodized salt; close to 80% of respondent households reported that the benefits of iodine are to prevent goiters, promote proper health and development of the fetus, and prevent mental delays among children (MOH and UNICEF 2010). However, greater commitment on the part of the government to address iodine nutrition is needed. Although there are mandatory laws for salt iodization, there is little government commitment to assist producers and enforcement and monitoring is lacking, leading to inadequately iodized salt by producers (Hassenfield and Berger 2012). The Tajikistan 2012 DHS indicates that although 83% of children live in households with iodized salt, only 39% of tested households had salt that was fortified with iodine at recommended levels.

Priority 3: Addressing Anemia and Micronutrient Deficiencies

Tajikistan should support efforts to address anemia and micronutrient deficiencies (such as vitamin A) among women and children through a multifaceted, preventive life cycle approach with parallel information, education, and communication about anemia and micronutrient deficiencies and their causes and consequences.

Anemia affects approximately a quarter of women and children under 5 in Tajikistan, and the proportion of children under 2 with anemia is approximately twice that. Addressing anemia in Tajikistan was ranked as a high priority for investment in Tajikistan, due to its potential for making the greatest reductions in malnutrition and LBW (Samah Rabie et al. 2012). In the case of Tajikistan, while greater sources of iron are needed in the diet, the majority of anemia cases appear to have causes other than iron deficiency. Vitamin A deficiency is still in the “severe” range of public health significance in Tajikistan and warrants continued efforts. The following are interventions to address anemia and micronutrient deficiencies.

- **Increasing sources of bioavailable micronutrients, particularly iron and vitamin A, in the diets of adolescents, women of reproductive age, and children under 2.** Dietary diversification, supplementation, and universal fortification or “home fortification” vehicles like multiple micronutrient powders or lipid-based nutrient supplements are potential ways to bring down anemia and micronutrient deficiency levels among these groups. Among women, improving preconception iron status has been shown to also lower rates of LBW (Bhutta et al. 2013). Other micronutrients (such as zinc) are likely also deficient in the diets of many Tajiks. Vitamin A and B vitamins (B6, B12, riboflavin, and folate) likely also play a role in the etiology of anemia, and similar approaches to increase intake (dietary diversification, supplementation, or universal/home fortification) are needed.
- **Preventing and managing infections that cause anemia through hemolysis or blood loss.** Regular deworming of pregnant women and children should reduce intestinal parasite load, blood loss, and anemia levels.
- **Ensuring delivery care practices do not contribute to anemia.** Delivery care practices can also affect anemia; preventing postpartum hemorrhage will help to prevent anemia in postpartum women and delayed umbilical cord clamping will prevent anemia in infants.

- **Determining the role of other factors in anemia etiology.** Genetic hemoglobin disorders (hemoglobinopathies) could play a role in anemia levels and the extent of their contribution should be assessed.

7 Recommendations for Bangladesh, India, Nepal, and Tajikistan

South Asia (Bangladesh, India, and Nepal)

In South Asia, while USAID has invested substantially in Bangladesh and Nepal, there are opportunities to further leverage and strengthen the nutrition focus of existing projects that have nutrition outcomes as their impact indicators. In Bangladesh, USAID’s Title II projects are most likely to show substantive impacts on stunting in their program areas because they have an explicit focus on integrating nutrition-specific interventions into their overall program design. However, other global health projects could also focus more on implementing direct nutrition interventions for their target population so that they are better able to meet their targets for impact on nutrition outcomes. Similarly, other global health projects in both Nepal and India could be required to strengthen their nutrition-specific activities to ensure services for nutrition are delivered along with other health service delivery. Global health projects that are focused on family planning and reproductive health in this region are, for example, ideally placed to strengthen and focus their efforts through direct interventions on adolescent nutrition, delaying marriage and first pregnancy, and promoting birth spacing—as these actions together can have a significant impact on improving birth outcomes and reducing LBW in their program areas. Similarly, projects that are more focused on improving agricultural production and are required to measure nutrition indicators could add nutrition-specific activities or strengthen their focus on promoting diet quality and diversity to help reduce malnutrition. Finally, a key area of focus for Bangladesh and India in particular is the management of acute malnutrition. The prevalence of acute malnutrition in these two countries accounts for a large proportion of the global burden of acute malnutrition and while there are well-established interventions that can be implemented, there is significant resistance in both of these countries to effectively address the issue.

In India, a strategic effort could be to strengthen nutrition governance and promote accountability for nutrition by using and building a broad-based advocacy approach to help the country and the states within work toward quality nutrition service delivery. Targeted support to system-strengthening and capacity building of community level providers within states of India that have high levels of malnutrition could be another area of focus and investment that could have a large impact on reducing stunting. These efforts could be undertaken in partnership with the Government of India or local partners.

Overall, given the burden of malnutrition in these three countries alone and the impact it has on the global prevalence of malnutrition, combined with USAID’s target of reducing stunting by 20%, increasing resources for nutrition would be justified to achieve USAID’s target for reduction and contribute to global goals in the reduction of malnutrition. Strategic areas of focus include advocacy and governance, creating a policy framework or translating policy to practice, systems and capacity strengthening, and models of quality nutrition service delivery.

Tajikistan

The nutrition priorities in Tajikistan differ in important ways from the priorities in the three countries in South Asia. The existing health programs funded and supported by USAID could expand their focus to include more direct activities on nutrition focused on areas such as improving IYCF practices and promoting exclusive breastfeeding, birth spacing and increasing the use of family planning services, and increasing access to micronutrient supplements for women and children. USAID could also engage directly with the Government of Tajikistan to strengthen the nutrition policy framework and provide technical assistance in strengthening the health service delivery system and capacity-strengthening of providers—with a particular emphasis on community level nutrition service delivery. Lastly, USAID

could work with local partners to engage in nutrition advocacy to raise awareness of and commitment for nutrition, promote accountability and governance for nutrition, and focus on key nutrition issues such as stunting, IYCF practices, micronutrient deficiencies, and promoting healthy family size.

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Appendix 1. Methods

Nationally representative datasets and reports that included nutrition and health data of women and children (as well as socioeconomic and demographic data) were used for Bangladesh, India, Nepal, and Tajikistan. The main sources of data used were Demographic and Health Surveys (DHS) or Multiple Indicator Cluster Surveys (MICS). Other sources of information used if DHS or MICS data were not available included Ministry of Health or food security/nutrition agency data (e.g., national nutrition survey or national micronutrient survey) reporting nationally-representative data on nutrition and/or health outcomes (e.g., in the case of Tajikistan). Several online databases were consulted for data, including the World Health Organization (WHO) Database on Growth and Malnutrition for anthropometric data for children; the WHO micronutrient database for data on anemia and iodine deficiency disorders; UNICEF’s database on estimated incidence of low birth weight; the United Nations Development Programme’s database on human development indicators; the CIA World Factbook for general facts about each country (population, economy, and governance); and the World Bank database of development indicators.

For nutrition indicators for children and women, standard definitions were used. Throughout the report and country profiles underweight is defined as a weight-for-age z-score less than -2; stunting is defined as height-for-age z-score less than -2; wasting is defined as weight-for-height z-score less than -2. “Moderate” underweight, stunting, and wasting refers to less than -2 but greater than -3 z-score, and “severe” refers to less than -3 z-score. All indicators are with reference to the 2006 *WHO Child Growth Standards*. For women of reproductive age, underweight was defined as body mass index (BMI) < 18.5; short stature as height < 145 cm; and overweight/obesity as BMI > 25.

In some cases, standard DHS indicators for child health and nutrition (e.g., percentage stunted), which focus on children under 5, were additionally analyzed for children under 2. However, trends (e.g., changes in stunting prevalence over consecutive surveys) were assessed using the entire 0–59 month age group. Infant and young child feeding indicators were reported using standard WHO definitions from *Indicators for assessing infant and young child feeding practices: Part 2 Measurement* (2010). Data for women were reported for the 15–49 year age group, disaggregating by smaller age groups (e.g., 15–19 years to examine nutritional status among adolescents) and physiological status (pregnant versus non-pregnant) when such groupings were permitted by the data.

To provide contextual information on the specific situation of the Asian region, searches of the scientific literature as well as “grey literature” were performed. PubMed was used for literature searches of scientific journal articles reporting on the specific causes and prevalence of malnutrition as well as consequences and solutions. The “snowball” method of literature review and PubMed’s “Related Citations” function were also employed to identify related scientific journal articles. Relevant publications from the grey literature were also consulted, such as those put forth by international organizations and government agencies (e.g., WHO, UNICEF, the World Bank, Copenhagen Consensus, and national ministries of health). For the identification of policies and programs with nutrition components, as well as donor activities in nutrition in each country, several different methods were used. Searches of the Scaling Up Nutrition website and WHO’s Global database on the Implementation of Nutrition Action provided listings of policies and programmatic actions at the country level, and individuals with country-specific experience were consulted for additional information. Donor activities were identified by searching each donor’s website as well as government (e.g., Ministry of Health) websites/documents.

Appendix 2. Additional Data

Table A.1. Nutritional Status of Women of Reproductive Age and Children Under 2 and Under 5

Children	Bangladesh (2011)		India (2005-2006)		Nepal (2011)		Tajikistan (2012)	
	0–23 months	0–59 months	0–23 months	0–59 months	0–23 months	0–59 months	0–23 months	0–59 months
Incidence of low birth weight (%)	22		22		12		7	
% underweight (< -2 WAZ)	28.0	36.4	38.2	42.5	25.9	28.8	13.6	12.1
% moderately underweight	19.8	26.0	23.4	26.7	18.8	21.1	9.3	8.4
% severely underweight	8.2	10.4	14.8	15.8	7.1	7.7	4.3	3.7
% stunted (< -2 HAZ)	34.5	41.3	39.2	48.0	26.3	40.5	22.6	26.2
% moderately stunted	22.0	26.0	20.7	24.3	16.1	24.3	13.3	16.5
% severely stunted	12.5	15.3	18.5	23.7	10.2	16.2	9.3	9.7
% wasted (< -2 WHZ)	15.5	15.6	26.1	19.8	16.4	10.9	15.0	9.9
% moderately wasted	10.8	11.6	16.6	13.4	11.9	8.3	9.3	6.0
% severely wasted	4.7	4.0	9.5	6.4	4.5	2.6	5.7	3.9
% anemic (Hb < 11 g/dL) ¹	70.9	51.3	82.0	69.5	68.6	46.2	45.5 ²	28.8 ²
Women of reproductive age (15–49 years of age)								
% underweight (BMI < 18.5 kg/m ²)	24.2 ³		35.6		18.2		10.6	
% overweight or obese (BMI ≥ 25 kg/m ²)	16.5 ³		12.6		13.4		29.7	
% short stature (< 145 cm)	13.3 ³		11.4		11.6		1.3	
% anemic (< 11 g/dL for pregnant women; < 12 g/dL for non-pregnant women)	42.4 ³		55.3		35.0		24.2 ²	

¹ Anemia is measured in children older than 6 months of age (i.e., 6–23 months and 6–59 months).

² Source: Micronutrient Status Survey in Tajikistan 2009 (MOH and UNICEF 2010)

³ Data are for “ever-married” women 15–49 years of age.

Appendix 3. Glossary of Terms

Term	Definition
Anemia	<p>A condition in which the hemoglobin (Hb) concentration in the blood is below a defined level, resulting in reduced oxygen-carrying capacity of red blood cells. About half of the 2 billion cases of anemia worldwide can be attributed to iron deficiency, which occurs when there are low iron reserves in the body because of low dietary intake, poor absorption of iron, or blood loss. Other causes include malaria, hookworm, and high fertility. Pregnant women, infants, and young children are particularly vulnerable to anemia. Anemia of all severities increases the risk of maternal and perinatal mortality, preterm birth and low birth weight, impaired cognitive development in children, and reduced adult work productivity. Anemia in women, infants, and young children is defined as:</p> <ul style="list-style-type: none"> • Hb < 12 g/dL in non-pregnant women of reproductive age • Hb < 11 g/dL in pregnant women and children 0–59 months
Complementary feeding	The provision of both breast milk and solid (or semi-solid) food to a child.
Exclusive breastfeeding	The feeding of an infant only with breast milk from his or her mother or a wet nurse, or expressed breast milk, and <i>no other</i> liquids or solids except vitamins, mineral supplements, or medicines in drop or syrup form. Exclusive breastfeeding is recommended until an infant reaches 6 months of age.
Low birth weight	Refers to when an infant weighs less than 2,500 g (5.5 lbs) at birth. It is an outcome of intrauterine growth retardation and/or premature birth. It is estimated that 4 million deaths, or 38% of all child deaths, occur during the first 28 days of life. Between 60 to 80% of children who die in the neonatal period have low birth weight, and 28% of neonatal deaths are directly attributable to low birth weight. Low birth weight is not only closely associated with fetal and neonatal mortality and morbidity, but also with inhibited growth, cognitive development, and chronic diseases later in life.
Malnutrition	An abnormal physiological condition caused by inadequate, excessive, or imbalanced intake of macronutrients, micronutrients, carbohydrates, protein, and fats.
Micronutrient deficiency	A consequence of reduced micronutrient intake and/or absorption in the body. The most common forms of micronutrient deficiencies are related to iron, vitamin A, and iodine deficiency.
Moderate acute malnutrition/ moderate wasting	<p>Moderate acute malnutrition, or moderate wasting, is defined by any of the following:</p> <ul style="list-style-type: none"> • Mid-upper arm circumference ≥ 110 mm and < 125 mm (the cutoff is being debated) • Weight-for-height ≥ -3 z-score and < -2 z-score of the median (WHO standards) • Weight-for-height as a percentage of the median $\geq 70\%$ and $< 80\%$ (NCHS references) <p>Moderate acute malnutrition can also be used as a population-level indicator defined by weight-for-height ≥ -3 z-score and < -2 z-score (WHO standards or NCHS references).</p>

Term	Definition
Severe acute malnutrition	<p>A child with severe acute malnutrition is highly vulnerable and has a high mortality risk. Severe acute malnutrition is defined by any of the following:</p> <ul style="list-style-type: none"> • The presence of bilateral pitting edema • Severe wasting (mid-upper arm circumference < 110 mm) (cutoff being debated) • Weight-for-height < -3 z-score (WHO standards) • Weight-for-height < 70% of the median (NCHS references) <p>Severe acute malnutrition can also be used as a population-based indicator defined by the presence of bilateral pitting edema or severe wasting (weight-for-height < -3 z-score (WHO standards)).</p>
Small for gestational age	<p>Refers to when an infant has intrauterine growth restriction and is below the 10th percentile of the recommended gender-specific birth weight for gestational age reference curves.</p>
Stunting	<p>Stunting, or chronic malnutrition, is a form of undernutrition. It is defined by a height-for-age z-score < 2 standard deviations of the median (WHO standards). Stunting is a result of prolonged or repeated episodes of undernutrition starting before birth. This type of undernutrition is best addressed through preventive maternal health programs aimed at pregnant women, infants, and children under 2 years. Program responses to stunting require longer-term planning and policy development.</p>
Undernutrition	<p>A consequence of a deficiency in nutrient intake and/or absorption in the body. Different forms of undernutrition, which can appear isolated or in combination, consist of: acute malnutrition (bilateral pitting edema and/or wasting), stunting, underweight (combined form of wasting and stunting), and micronutrient deficiencies.</p>
Underweight	<p>A composite form of undernutrition, including elements of stunting and wasting, and is defined by a weight-for-age z-score < 2 standard deviations of the median (WHO standards). This indicator is commonly used in growth monitoring and promotion and child health and nutrition programs aimed at the prevention and treatment of undernutrition.</p>
Wasting	<p>Describes nutritional status as measured by weight-for-height. A child who is less than -2 standard deviations from the reference median for weight-for-height is considered to be too thin for his/her height, or wasted, a condition reflecting acute or recent nutritional deficit. As with stunting, wasting is considered severe if the child is less than -3 standard deviations from the reference mean. Severe wasting is closely linked to mortality risk.</p>

