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# Overview of the Nutrition Situation in Seven Countries in Southeast Asia

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April 2014



This report is made possible by the generous support of the American people through the support of the Office of Health, Infectious Diseases, and Nutrition, Bureau for Global Health, U.S. Agency for International Development (USAID) and USAID Bureau for Asia under terms of Cooperative Agreement No. AID-OAA-A-12-00005, through the Food and Nutrition Technical Assistance III Project (FANTA), managed by FHI 360.

The contents are the responsibility of FHI 360 and do not necessarily reflect the views of USAID or the United States Government.

The intended purpose of this report is to provide a broad overview of the status of nutrition in Burma, Cambodia, Indonesia, Laos, the Philippines, Timor Leste, and Vietnam 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](http://www.usaid.gov/what-we-do/global-health/nutrition).

#### **Recommended Citation**

Chaparro, C.; Oot, L.; and Sethuraman, K. 2014. *Overview of the Nutrition Situation in Seven Countries in Southeast Asia*. Washington, DC: FHI 360/FANTA.

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## Abbreviations and Acronyms

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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
SHOUHARDO	Strengthening Household Abilities for Responding to Development Opportunities
SUN	Scaling Up Nutrition
ug	microgram(s)
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 undernutrition, 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.

## USAID Focus Countries in Southeast Asia Discussed in this Report

- Burma (Myanmar)
- Cambodia
- Indonesia
- Laos
- Philippines
- Timor Leste
- Vietnam

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 2011<sup>1</sup>) (Black et al. 2013)
  - Of the five subregions in Asia, Southeast Asia<sup>2</sup> has the second highest prevalence and total number of children who are stunted (29.4%, 15.6 million), wasted (9.4%, 5.0 million) and underweight (18.3%, 9.7 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

<sup>1</sup> 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.

<sup>2</sup> Southeast Asia (as defined by the United Nations) includes Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Timor-Leste, and Vietnam.

(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)

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 with 31 countries in Asia, seven of which are discussed in this report, representing the Southeast region of Asia: Burma (Myanmar), Cambodia, Indonesia, Laos, the Philippines, Timor Leste, and Vietnam. Four of these seven focus countries (Burma, Indonesia, the Philippines, and Vietnam) 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 seven selected countries will serve to provide a snapshot of the nutrition situation in a portion of the Southeast Asian region where malnutrition is highly prevalent and identify potential causes experienced in this part of the world, which are likely shared among many countries in Southeast 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 seven 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 the seven countries of focus in this report (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

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### 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). Compared to its other global regions, the World Health Organization’s (WHO’s) Southeast Asia and Western Pacific regions have the highest percentages (52% and 54%, respectively) of mortality for children under 5 years of age attributable to neonatal deaths (Liu et al. 2012).<sup>3</sup>

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, 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 malnutrition (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). Gender inequity, in terms of access to food, health care, income,

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<sup>3</sup> The WHO Western Pacific region includes 37 countries, including four countries in this report: Laos, the Philippines, Vietnam, and Cambodia. Burma, Indonesia, and Timor Leste are part of the WHO Southeast Asia region.

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 Indonesia, showed that only a little over half of children under 2 (53%) were receiving enough meals for their age per day, although dietary diversity was higher (68%) than that seen in other South Asian countries examined (Ng 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—approximately 1.25 billion people in WHO's Western Pacific region according to estimates from 2004 (WHO 2008)—followed by pneumonia and other lower respiratory infections—affecting 46 million in WHO's Western Pacific 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 foods, 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. 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, 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. Land ownership is also affected by political and civil upheaval, as in Timor Leste, which is recovering from significant conflict in 2006 and has a much longer history of conflict and occupation, and in recent years has not had an effective system to resolve land tenure disputes (IRIN 2011). 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 women relative to men 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 focus countries in this review, Timor Leste and Indonesia have most recently suffered from political unrest/instability or civil war, while Vietnam and Cambodia have older histories of decades-long conflict and violence. Populations experiencing and recovering from such political instability and/or violence will be inequitably affected, for example, women and children are most severely affected by civil strife and the poor experience particular health and nutrition inequities during the rebuilding period. 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.

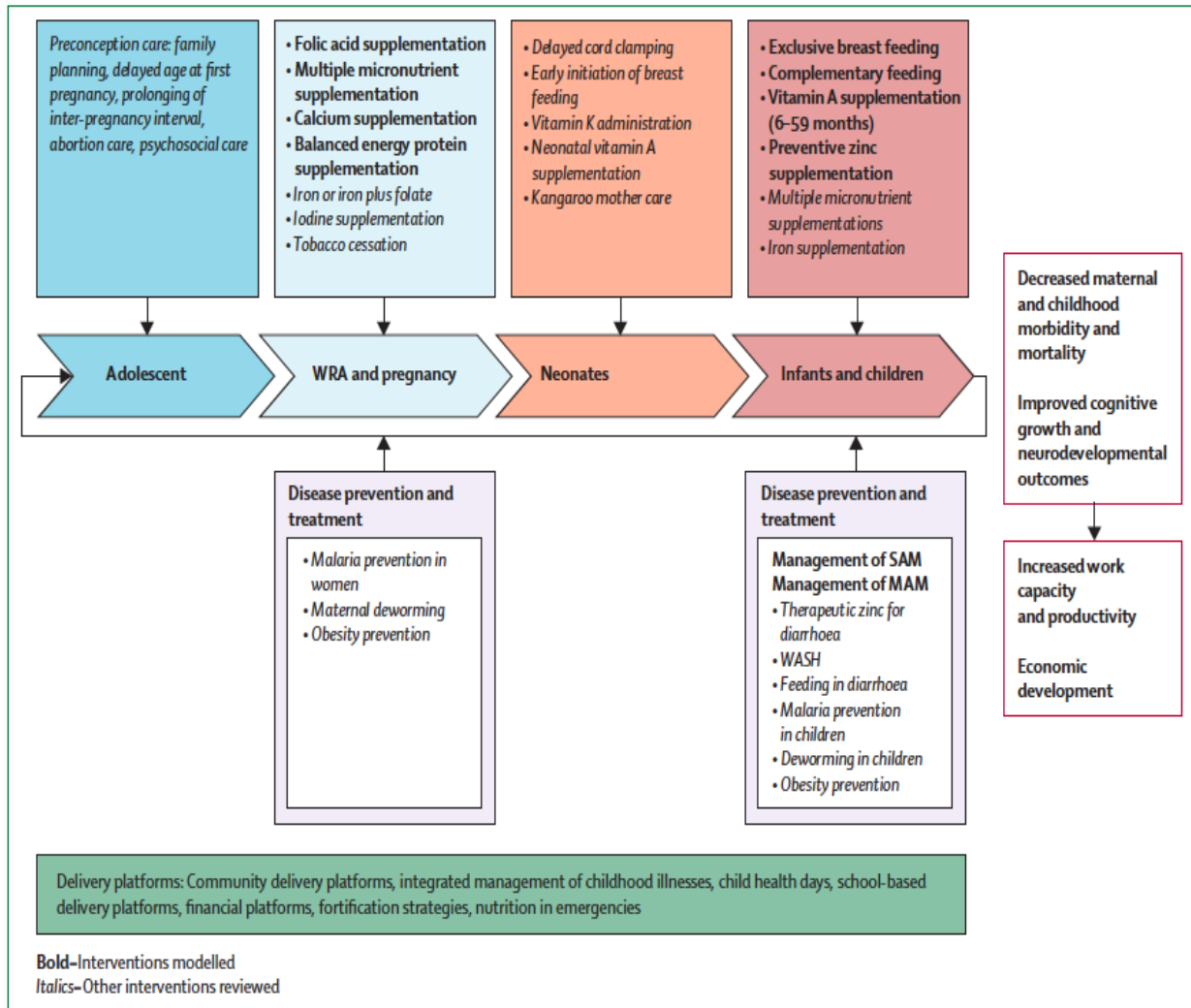
**Governance.** The role of government (or lack thereof) is a critical underlying factor contributing to malnutrition. Tackling malnutrition requires that governments demonstrate good “nutrition governance” through: sustained political commitment to improving nutrition that can withstand changes in leadership 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 (Burma, Indonesia, and Laos).

### **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/latrine 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 a 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 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, Cambodia is a Feed the Future focus country and Cambodia, Indonesia, the Philippines, and Vietnam have global health programs. These 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 seven countries examined in this report had funds specifically dedicated (and specifically tracked) to address malnutrition (Cambodia and Indonesia). 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. Even with substantive investments in nutrition-sensitive activities, within these projects and activities clear and direct nutrition-specific approaches and activities are needed to achieve the targets set for improved nutrition outcomes.

### 3 Nutritional Status in Burma, Cambodia, Indonesia, Laos, the Philippines, Timor Leste, and Vietnam

This section describes the main forms of malnutrition present among women and children in the seven selected countries in Southeast Asia. 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 otherwise noted, typically from Demographic and Health Surveys (DHS) or Multiple Indicator Cluster Surveys (MICS).<sup>4</sup>

#### Summary

Approaches to reducing malnutrition across the seven Southeast Asian countries examined should have a strong focus on postnatal determinants of stunting and wasting, namely improving infant and young child feeding (IYCF) practices, particularly exclusive breastfeeding and improved complementary feeding practices. This can be done through the following policy and programmatic interventions: support for baby-friendly hospital certification and maintenance (in countries where facility delivery is higher), maternity leave legislation to permit a longer-period of exclusive breastfeeding, community-based counseling and support, and stronger enforcement of the Code of Marketing of Breast Milk Substitutes.

Maternal malnutrition and LBW continues to be an area of concern in several Southeast Asian countries, particularly Cambodia, Timor Leste, the Philippines, and Laos. Significantly greater attention and support is needed to ensure evidence-based nutrition interventions are implemented prior, during, and after pregnancy, which address preconception family planning, adequate prenatal care, multi-micronutrient (including iron, folic acid, and calcium) supplementation, adequate weight gain, skilled care during delivery, and adequate birth spacing. Interventions to address the multiple causes of anemia (addressing iron and other micronutrient deficiencies, malaria, and intestinal helminths) are needed in most countries examined. In many countries, specific micronutrient deficiencies require continued interventions such as increased coverage with supplements or mass or home fortification approaches, most notably, for vitamin A deficiency in Cambodia, Burma, and Laos and for iodine deficiency in Vietnam and Timor Leste. At the same time, overweight among women is emerging in some countries, especially in the Philippines and Indonesia, indicating a need for preventive actions involving both diet and physical activity among this group, although the level of underweight among women still exceeds overweight/obesity levels in most countries examined.

#### Low Birth Weight and Child Malnutrition

- Of the countries with trend data, LBW has decreased in Cambodia, Indonesia, and Vietnam since 2000, while in Laos and the Philippines the incidence of LBW has increased. Of all seven countries, the Philippines has the highest level of LBW (21%) and Vietnam the lowest (5%).

<sup>4</sup> Data sources that were used for each country and for trend data are listed at the end of this report in the Country Data Sources section.

- The proportion of children under 5 who are stunted or wasted is highest in Timor Leste, where more than half of children are stunted and a third are severely stunted. Nearly 1 in 5 children in Timor Leste is wasted. Laos, Cambodia, and Indonesia have the next highest levels of stunting (approximately 40%) while Indonesia has the next highest level of wasting (12%).
- Vietnam has shown the greatest progress of the seven countries in reducing underweight and stunting among children under 5. In contrast, Laos, Indonesia, the Philippines, and Timor Leste have made little to no progress in reducing stunting since 2000.
- Wasting has increased in the Philippines since 2003, in Timor Leste since 2002, and in Cambodia since 2005. In contrast to its lack of progress in reducing stunting prevalence, Laos saw the greatest reductions in the prevalence of wasting since 2000.

#### Maternal Nutrition

- Timor Leste has the greatest proportion of underweight women (27%) of the six countries with data, although the proportion of women with low body mass index (BMI) has decreased considerably from 2003 to 2010.
- In the Philippines, the percentage of women of reproductive age who are overweight or obese (27%) is approximately twice the proportion who are underweight, and Indonesia has the highest proportion of women who are overweight. In the other countries examined with available data, the proportion of underweight women still remains higher than the proportion who are overweight/obese.

#### Micronutrient Status

- Anemia affects between roughly a third and three-quarters of children under 2, and between a quarter and half of women of reproductive age in the Southeast Asian countries examined. There has been mixed progress in reducing anemia among women.
- Vitamin A deficiency is of greatest concern in Burma and Laos (where 30% of preschool-age children are estimated to be deficient), while iodine deficiency is estimated to be highest in Vietnam and Timor Leste.

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

LBW in the seven Southeast Asian countries examined ranges from a low of 5% of births in Vietnam to a high of 21% of births in the Philippines (see **Figure 2**). From repeated national estimates of LBW available for 6 of the 7 Southeast Asian countries examined, the incidence of LBW has decreased in Cambodia, Indonesia, Timor Leste, and Vietnam. The estimated incidence of LBW in Vietnam is now on the order (or better than) many wealthier, developed countries (UNICEF 2013). The incidence of LBW in Laos and the Philippines has deteriorated (see **Figure 3**). Trends in and estimates of LBW should be interpreted with caution due to frequent underreporting of birth weight in many countries. However, the lack of improvement in LBW over time in several countries indicates that greater attention is needed to address early malnutrition, particularly prenatally, but also over the life course to break the intergenerational transmission of malnutrition.



Infant mortality (under 1 year) makes up the majority of under-5 mortality in the Southeast Asian countries examined, and neonatal mortality (under 1 month) constitutes a half to two-thirds of infant mortality (see **Figure 4**). Globally, LBW is associated with greater mortality during the neonatal period, particularly if the infant is also premature, and accounts for roughly 12% of under-5 mortality (Black et al. 2013). Although under-5 mortality has decreased across the region, progress has been slowest for reductions in neonatal mortality, which needs strengthened attention to address the three main causes of neonatal mortality—infections, prematurity, and birth asphyxia (Lawn et al. 2010).

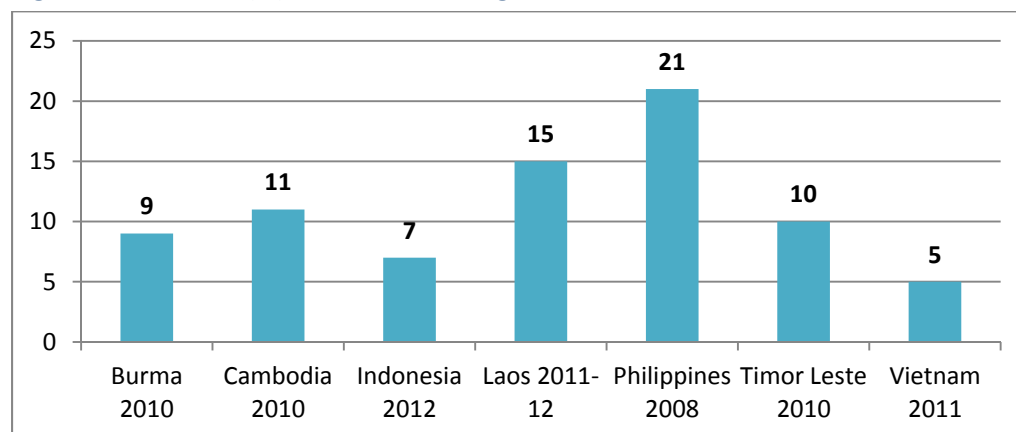
According to most recent nationally-representative data available for the seven Southeast Asian countries, Timor Leste has the greatest proportion of children who are stunted and the greatest proportion who are wasted (see **Table 1**). More than half of children under 5 in Timor Leste (58%) are stunted and 1 in 3 are severely stunted, a much higher percentage than in the six other Southeast Asian countries examined. Close to 1 in 5 children (19%) in Timor Leste are wasted, and 5% of them severely wasted. Also notable in Timor Leste is that male children are consistently more undernourished than female children; 60% of male children under 5 versus 56% of female children under 5 are stunted and 20% of male children under 5 versus 17% of female children under 5 are wasted. Although other countries exhibit slight differences between sexes in the proportion malnourished (e.g., in Cambodia, Laos, and Vietnam boys are also slightly more likely to be stunted), the consistency of the relationship across malnutrition indicators and the magnitude is not as pronounced as in Timor Leste. Cambodia and Laos have the next highest levels of stunting among children under 5 (around 40%), while Indonesia has the next highest levels of wasting (12%) among children under 5. Cambodia and Indonesia have slightly higher levels of wasting among children under 2 (14–15%) (see **Appendix 2, Table A.1**). In other countries as well, levels of wasting are higher among children under 2 (and particularly among children under a year of age) than among children under 5. National-level estimates of stunting and wasting, however, mask disparities within countries, particularly by region, ethnic group (Vietnam and Laos in particular), rural residence, maternal education (see **Figure 5**), and wealth status. As shown in **Figure 6**, stunting is much more prevalent among the poorest populations, with particularly large differences in Laos and Vietnam. In Laos, 61% of children under 5 are stunted in the lowest wealth quintile compared to 20% in the highest, and in Vietnam only 6% of children in the highest wealth quintile are stunted compared to 41% in the lowest.

In terms of absolute numbers, due to larger population size, Indonesia has by far the greatest number of stunted and wasted children under 5—over 9 million Indonesian children are stunted and more than 4.5 million severely so, while almost 3 million are wasted and over a million are severely wasted (see **Table 1**). The Philippines follows Indonesia in terms of total numbers of stunted and wasted children (over 3.5 million stunted and over 800,000 wasted).

Stunting among children under 5 has been declining in Burma, Cambodia, and Vietnam since 2000. In Indonesia and Laos, stunting has remained relatively stable, whereas in the Philippines and Timor Leste, stunting prevalence has actually increased between the last two surveys (see **Figure 7**). Slightly better progress has been made in terms of underweight in Burma, Cambodia, Laos, and Vietnam, but in the Philippines no progress has been made since 2003 and in Indonesia prevalence actually increased since 2010. Vietnam has been the most successful of the seven countries examined in reducing levels of stunting and underweight, with stunting prevalence decreasing 13 percentage points in 5 years and underweight prevalence decreasing 8 percentage points during the same period. Changes in wasting prevalence are somewhat more mixed and do not necessarily follow the pattern of progress seen in stunting and underweight for each country, likely due to slightly different causal pathways and determinants. Of the seven Southeast Asian countries, Burma, Cambodia, Indonesia, Laos, and Vietnam have seen declines since 2000 (with Laos having the greatest average annual reduction). The Philippines

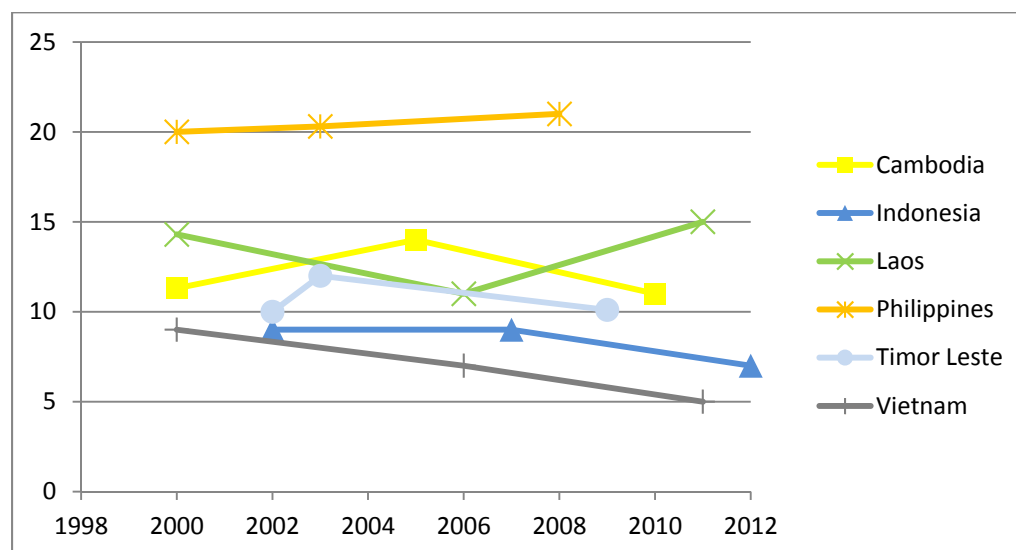
and Timor Leste have experienced *increases* in wasting among children under 5 (with Timor Leste having the greatest average annual increase, although the trend decreased between the last two surveys).

**Figure 2. Incidence (%) of Low Birth Weight**



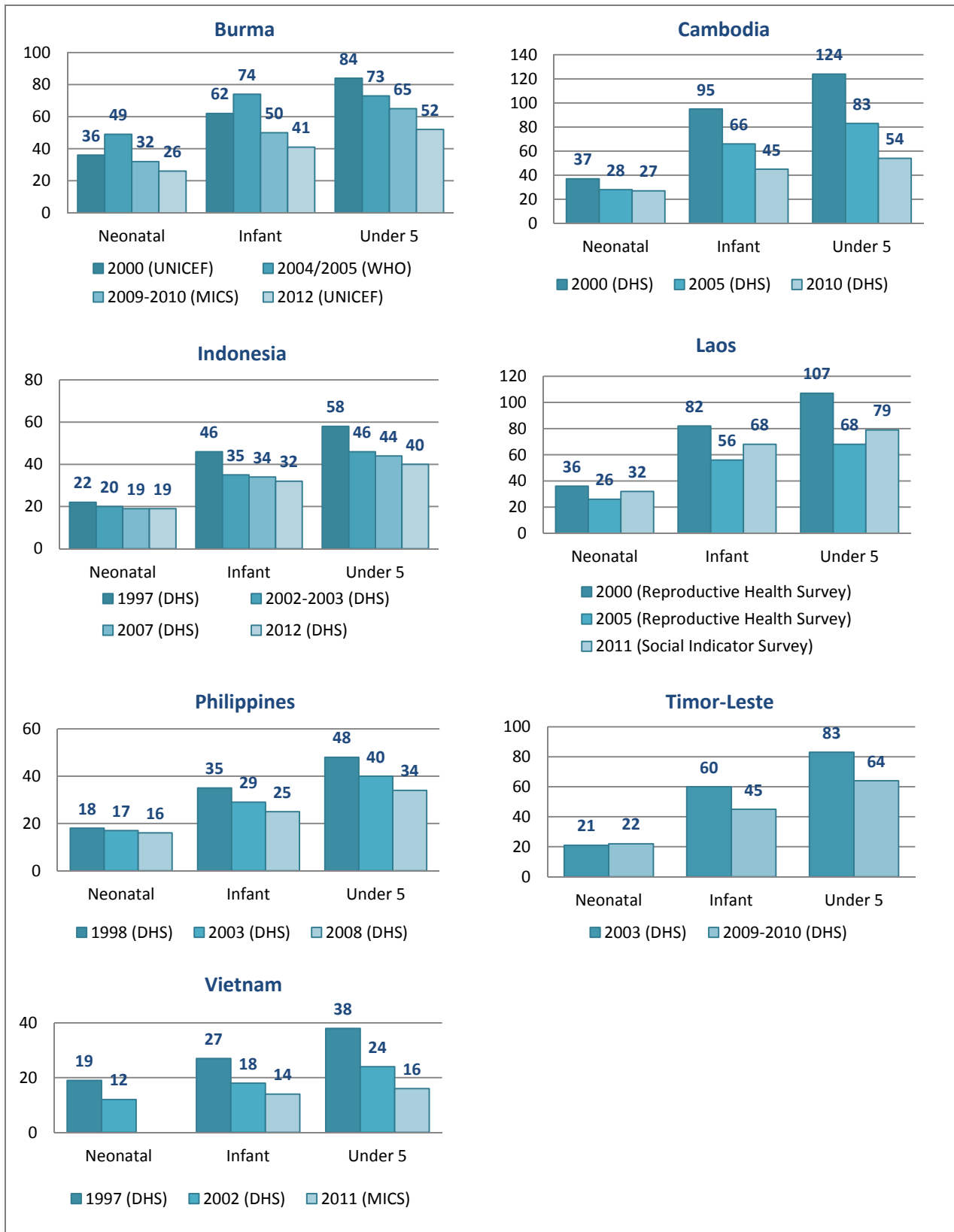
Sources: UNICEF 2013; Indonesia DHS 2012; Timor Leste DHS 2009–10; Lao Social Indicator Survey 2011–2012

**Figure 3. Trends in the Incidence (%) of LBW for Countries with Repeated National Estimates, 2000 to 2012**

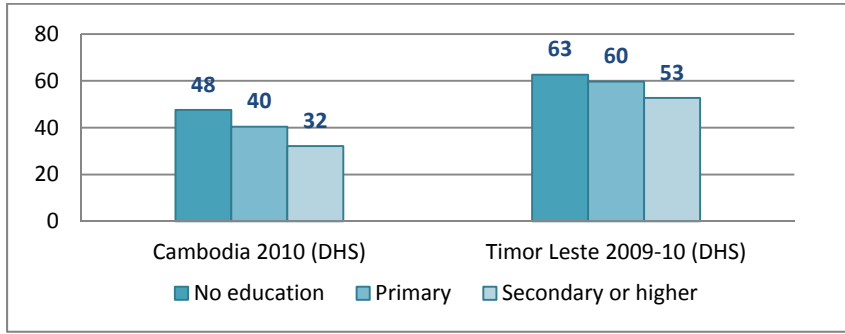


Sources: Indonesia DHS 2012; Laos Social Indicator Survey 2011–2012; Timor Leste DHS 2009–2010; UNICEF 2009 and 2013; UNSCN 2010

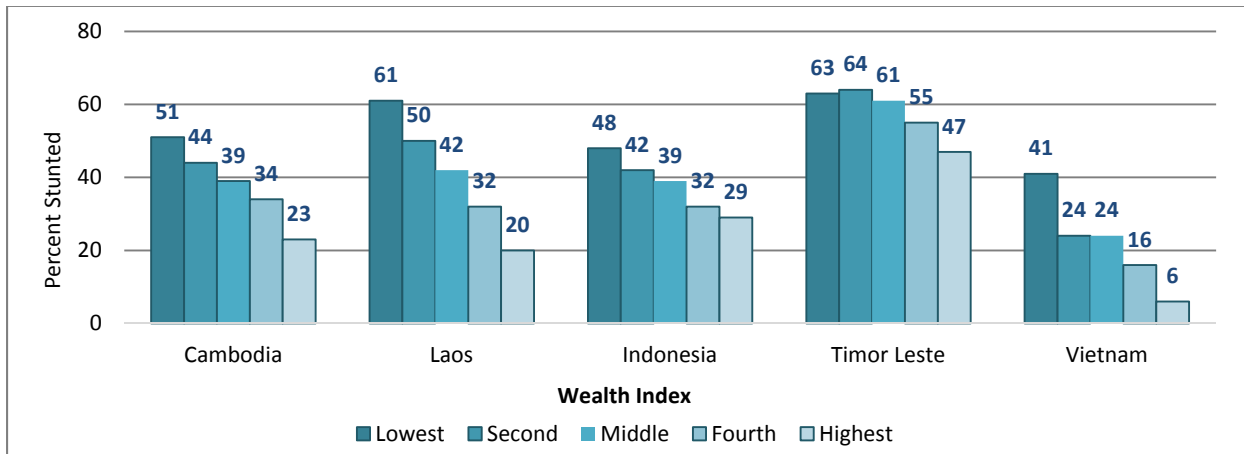
Figure 4. Neonatal, Infant, and Under-5 Mortality Rates (per 1,000 Live Births)



**Figure 5. Stunting Prevalence (%) by Maternal Education Levels, Cambodia and Timor Leste**



**Figure 6. Stunting Prevalence of Children Under 5 by Wealth Index**

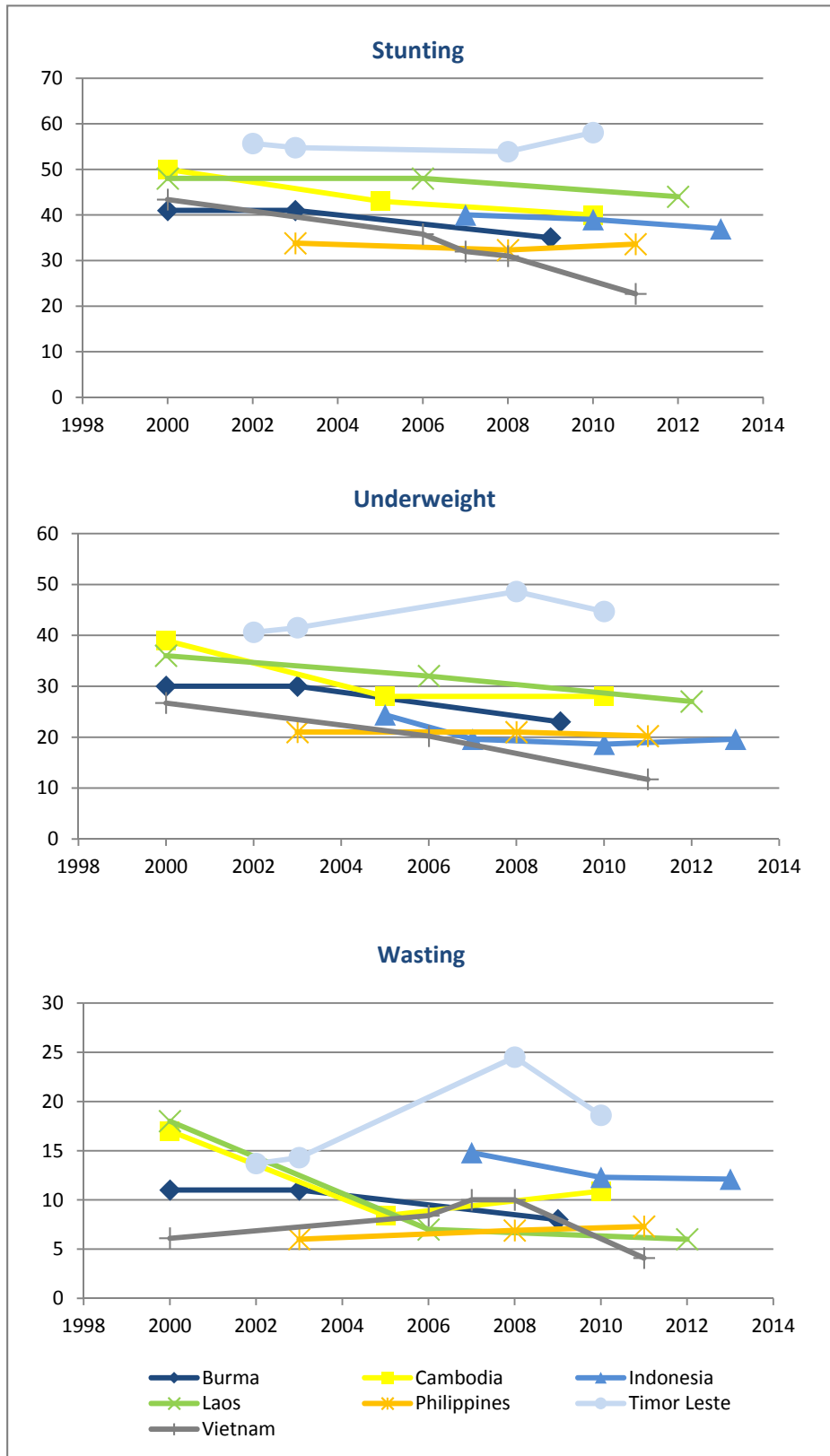


**Table 1. Number of Children Under 5 Affected by Malnutrition**

	Under 5 Population*	Underweight (Total, Moderate, and Severe)		Stunting (Total, Moderate, and Severe)		Wasting (Total, Moderate, and Severe)	
		%	#	%	#	%	#
<b>Burma (2009–10 MICS)</b>	4,434,400	<b>22.6%</b>	<b>1,002,174</b>	<b>35.1%</b>	<b>1,556,474</b>	<b>7.9%</b>	<b>350,318</b>
		17.0%	753,848	22.4%	993,306	5.8%	257,195
		5.6%	248,304	12.7%	563,169	2.1%	93,122
<b>Cambodia (2010 DHS)</b>	1,669,197	<b>28.3%</b>	<b>472,383</b>	<b>39.9%</b>	<b>666,010</b>	<b>10.9%</b>	<b>181,942</b>
		21.6%	360,547	26.3%	438,999	9.3%	155,235
		6.7%	111,836	13.6%	227,011	1.6%	26,707
<b>Indonesia (2013 Riskesdas)</b>	24,622,400	<b>19.6%</b>	<b>4,825,990</b>	<b>37.2%</b>	<b>9,159,533</b>	<b>12.1%</b>	<b>2,979,310</b>
		13.9%	3,422,514	18.0%	4,432,032	6.8%	1,674,323
		5.7%	1,403,477	19.2%	4,727,501	5.3%	1,304,987
<b>Laos (2011–12 Social Indicator Survey)</b>	889,200	<b>26.6%</b>	<b>236,527</b>	<b>44.2%</b>	<b>393,026</b>	<b>5.9%</b>	<b>52,463</b>
		19.4%	172,505	25.4%	225,857	4.5%	40,014
		7.2%	64,022	18.8%	167,170	1.4%	12,449
<b>Philippines (2011 Nutritional Status Survey)</b>	11,164,600	<b>20.2%</b>	<b>2,255,249</b>	<b>33.6%</b>	<b>3,751,306</b>	<b>7.3%</b>	<b>815,016</b>
		1.9%	1,764,007	23.2%	2,590,187	4.9%	547,065
		4.4%	491,242	10.4%	1,161,118	2.4%	267,950
<b>Timor Leste (2009–10 DHS)</b>	190,300	<b>44.7%</b>	<b>85,064</b>	<b>58.1%</b>	<b>110,564</b>	<b>18.6%</b>	<b>35,396</b>
		29.3%	55,758	25.5%	47,956	13.9%	26,452
		15.4%	29,306	32.9%	62,609	4.7%	8,944
<b>Vietnam (2011 MICS)</b>	7,184,200	<b>11.7%</b>	<b>840,551</b>	<b>22.7%</b>	<b>1,630,813</b>	<b>4.1%</b>	<b>294,552</b>
		9.9%	711,236	16.7%	1,199,761	2.9%	208,342
		1.8%	129,316	6.0%	431,052	1.2%	86,210

\* Under-5 population are 2012 estimates from [www.unicef.org/infobycountry/](http://www.unicef.org/infobycountry/) except for Cambodia which is from [http://www.who.int/maternal\\_child\\_adolescent/epidemiology/profiles/neonatal\\_child/khm.pdf](http://www.who.int/maternal_child_adolescent/epidemiology/profiles/neonatal_child/khm.pdf).

**Figure 7. Trends in the Prevalence (%) of Stunting, Underweight, and Wasting Among Children Under 5, 2000 to 2012 (Based on Repeated National Estimates)**



## Maternal Underweight, Short Stature, and Overweight/Obesity

Nationally-representative data on the nutritional status of women of reproductive age and pregnant and lactating women are limited for the Southeast Asian countries examined. Of the countries with data on underweight (all but Burma), Timor Leste has the greatest proportion of women of reproductive age affected and Indonesia the fewest (see **Appendix 2, Table A.2**). At the opposite end of the nutrition spectrum, the prevalence of women who are overweight is highest in Indonesia and the Philippines, affecting almost a third of women in Indonesia and more than a quarter of women in the Philippines, where there are nearly twice as many women who are overweight than underweight. The prevalence of underweight women is higher than the prevalence of overweight/obese women in Cambodia, Timor Leste, and Vietnam; in Laos the prevalence is about equal.

Cambodia and Timor Leste have consecutive surveys from the past decade measuring malnutrition among women of reproductive age. In Cambodia, the prevalence of underweight has remained essentially the same since 2000 (20.7% in 2000 to 19.1% in 2010); in contrast, the prevalence of underweight among women in Timor Leste decreased by 10 percentage points between 2003 (37.7%) and 2010 (27.2%). The prevalence of short stature in Cambodia appears to have deteriorated between 2000 and 2010 (from 5.5% of women in 2000 to 6.3% in 2010). No other countries have trend data available on short stature among women of reproductive age.

## Anemia

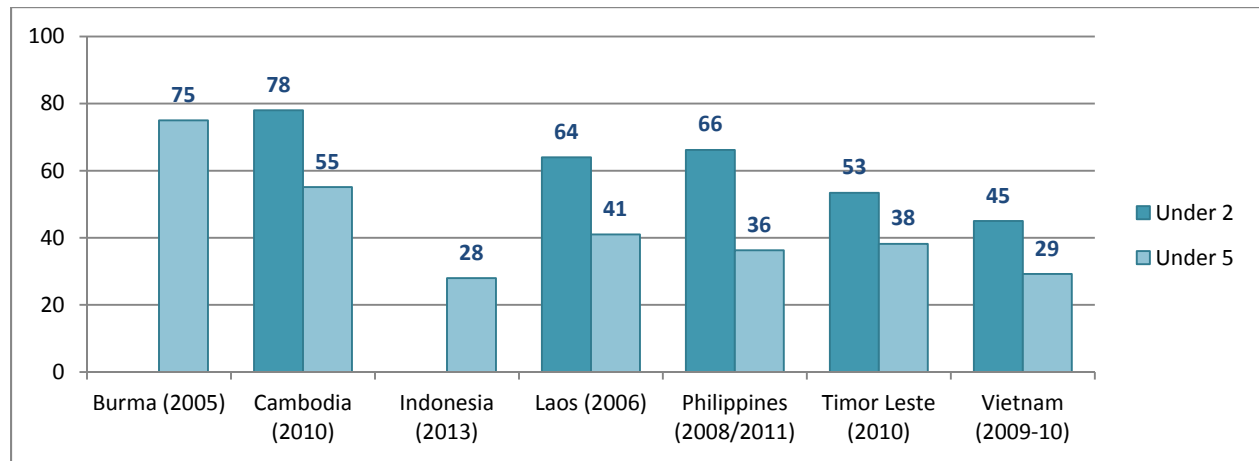
Anemia in children is a serious cause for concern as it can negatively and irreversibly affect cognitive, motor, and behavioral development with long-term implications for learning, scholastic achievement, and earnings. Nationally-representative data on the prevalence of anemia among children were available in all of the Southeast Asian countries (see **Appendix 2, Table A.1** and **Figure 8**). The 6–23 month period (and more specifically, the 6–12 month period) constitutes a high-risk period for the development of anemia, particularly due to iron deficiency, which underlies a large percentage of anemia cases in this age group. Thus, looking at anemia prevalence in children under 5 (which is considerably lower than among children under 2) will mask the true magnitude of the problem, which is particularly concerning due to the negative effects of iron deficiency and anemia on cognitive, motor, and behavioral development that occur during the first 2 years of life. Anemia affects between 45 and 78% of children under 2 in the five countries with data available for this age group. Less maternal education, rural households, and lower wealth status are frequently (although not always) associated with greater anemia risk among children, and there are country-by-country regional variations as well. In terms of progress in reducing anemia in children, in Cambodia, anemia among children under 5 has declined from 62% of children in 2005 to 55% in 2010. However, in Timor Leste, 32% of children under 5 were anemic in 2003, compared to 38% in 2010, indicating that there has been a deterioration in the nutritional status (or other causes of anemia) during this time period. In Burma 3 out of 4 children under age 5 are anemic. In Cambodia, iron deficiency, vitamin A deficiency, general infection (as measured through markers of inflammation), and genetic hemoglobin disorders (which affected 60% of rural Cambodian children) were all associated with anemia in children under 5 months of age (George et al. 2012), indicating the range of factors potentially contributing to anemia apart from iron deficiency, which in this population was associated with slightly less than half of anemia cases. 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**).

Anemia in women is associated with greater maternal morbidity and mortality as well as poor birth outcomes, including prematurity, low birth weight, and worsened iron status of offspring. The range of the prevalence of anemia in the seven Southeast Asian countries is quite wide—from 19% of non-

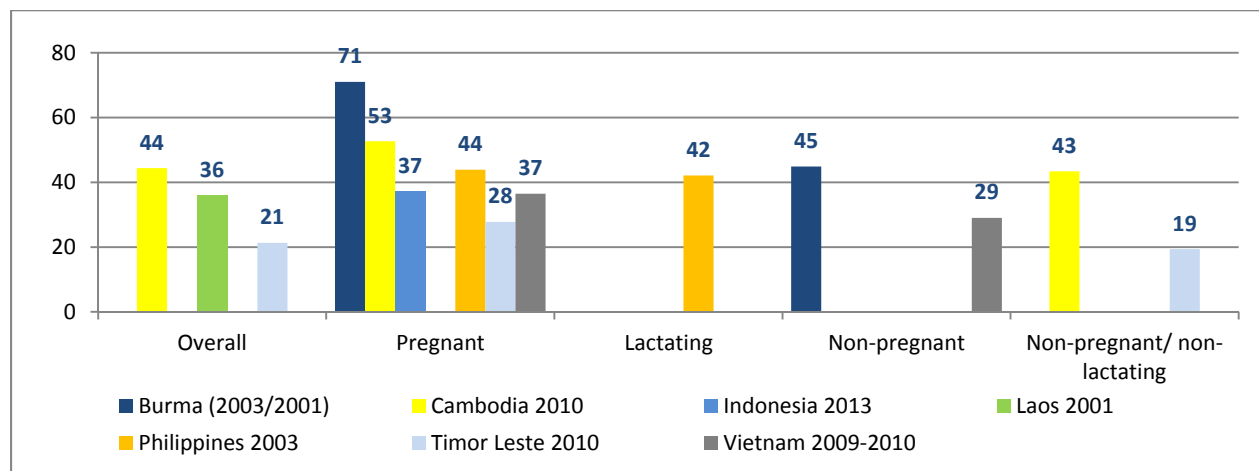
pregnant women of reproductive age in Timor Leste to roughly twice that in Burma and Cambodia (see **Figure 9**). As in most countries, the prevalence of anemia among pregnant women—who have significantly higher iron needs—is higher than in the general population of women or in non-pregnant women.

From repeated national surveys available from four countries (UNSCN 2010), there is mixed progress on reducing anemia among women of reproductive age (see **Figure 10**). Vietnam saw significant reductions in anemia prevalence among women between the 1995 and 2001, although the two most recent estimates indicate either a plateau or deterioration of status. Cambodia has also seen declines in anemia, the greatest decline (11 percentage points) between 2000 and 2005, followed by a smaller reduction between 2005 and 2010. The Philippines presents a long history of progress and setbacks in terms of anemia prevalence among women, and although there are only two recent data points for Burma (1995 and 2001), the direction was upwards in terms of anemia prevalence among this vulnerable group.

**Figure 8. Prevalence (%) of Anemia Among Children Under 5 and Children Under 2**

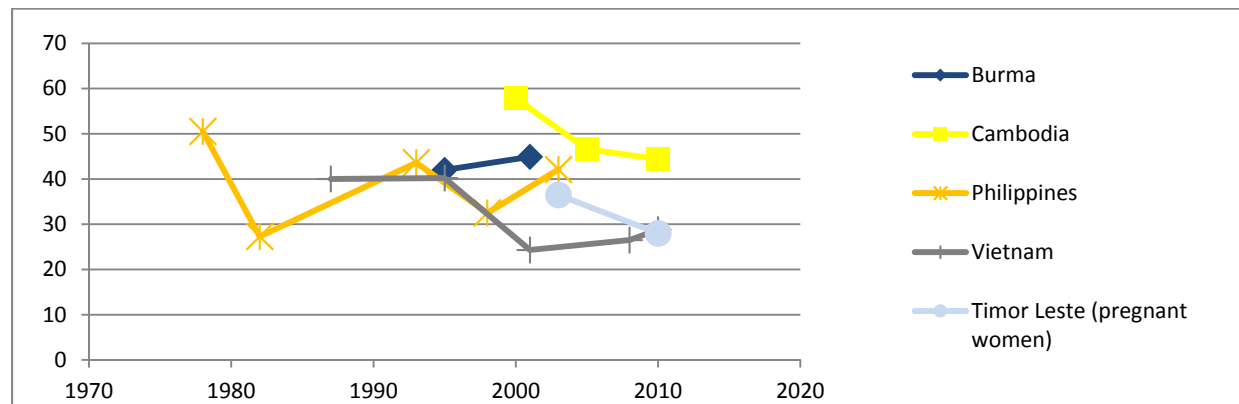


**Figure 9. Prevalence of Anemia Among Women of Reproductive Age by Physiological Status According to Nationally-Representative Data**





**Figure 10. Trends in Anemia Prevalence (%) Among Non-Pregnant Women of Reproductive Age (15–49 Years) for Countries with Available Data from Repeated National Surveys**



### 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. 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 and many anemia cases 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 and iodine deficiencies have generally been declining in Southeast Asia. The main programmatic vehicles for targeting these deficiencies are provision of vitamin A supplements (generally provided twice annually to children 6–59 months of age, and in many countries in the first 6–8 weeks postpartum) and iodization of salt (or other food staples fortified with iodine).

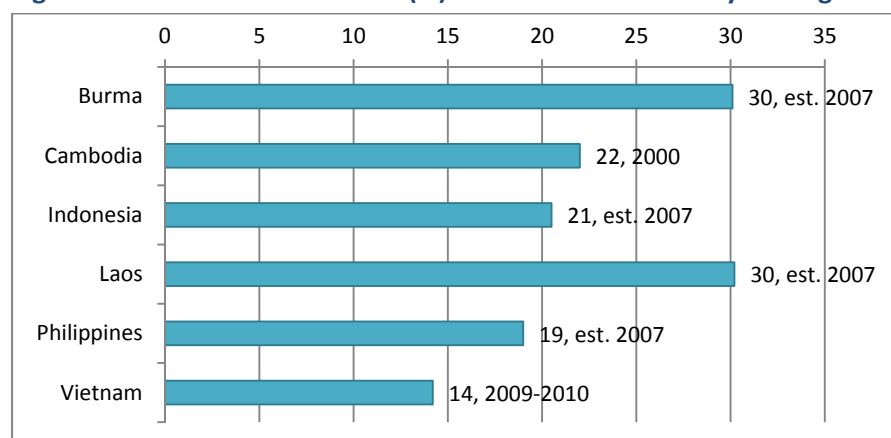
Vitamin A deficiency can be measured through clinical signs, which are only visible in severe deficiency and generally affect the eye (e.g., night blindness, “Bitot’s spots,” which are a buildup of keratin on the conjunctiva of the eye, or xerophthalmia which is characterized by dryness and wrinkling of the cornea that can lead to blindness). Prevalence of severe vitamin A deficiency where clinical signs are visible has fallen to levels below what is considered “significant prevalence” (greater than 1% for night blindness or

greater than 0.5% for Bitot’s spots) in all of the countries with available data except for Cambodia, which remained slightly above the cut-off as of 2000, with a prevalence of xerophthalmia among preschool-age children of 1.05%, although more recent data are needed (UNSCN 2010).

Vitamin A deficiency can also be assessed through measuring serum retinol in the blood to determine the level of “subclinical” vitamin A deficiency,<sup>5</sup> where vitamin A is inadequate but not enough so to produce clinical signs. There are data on “subclinical” vitamin A deficiency as determined by serum retinol levels for Cambodia and Vietnam, and estimates have been made as of 2007 for four other countries (UNSCN 2010) (see **Figure 11**; no estimate was provided for Timor Leste). According to the WHO guidelines for classifying the public health significance of vitamin A deficiency, Burma, Cambodia, Indonesia, and Laos are at the greatest level of concern, due to an estimated prevalence of vitamin A greater than 20%. In Timor Leste, DHS data showed that night blindness among pregnant women fell from 13% in 2003 to 2% in 2009–2010. A proportion of preschool-age children were also suffering from symptoms of nightblindness in Timor Leste—approximately 7% of children 12–59 months of age were reported to show restricted movement in the evenings and 12% bumped or tripped on objects at night, proxy indicators for night blindness in children.

Iodine deficiency, generally assessed through urinary iodine concentration, can negatively affect children’s health and cognitive development, affects thyroid function, and jeopardizes pregnancy outcomes and fetal development. Vietnam currently has the greatest proportion of school children with low urinary iodine concentration (54% as of 2009) (National Hospital of Endocrinology) and the median urinary iodine concentration for women of reproductive age (15–44) was estimated at 83 ug/L (indicative of a “mild” iodine deficiency problem in this population) (Tran 2012). Mandatory salt iodization laws and financing had previously been quite successful in reducing iodine deficiency, however, changes in 2005, making salt iodization voluntary, are credited with the resurgence in inadequate iodine intake (ibid) (see the Vietnam nutrition profile for more details). Iodine deficiency also appears to be an issue in Timor Leste, where areas of the country report 20% goiter prevalence, indicating a moderate level of deficiency (MDG Achievement Fund 2009). While iodine deficiency may be an issue in Vietnam and Timor Leste, the median urinary iodine concentration of school-age children in Cambodia and Indonesia indicates that iodine intake is above optimal levels and may need to be monitored.

**Figure 11. Estimated Prevalence (%) of Vitamin A Deficiency Among Preschool-Age Children**



<sup>5</sup> Sub-clinical vitamin A deficiency is generally defined as serum retinol < 20 ug/dL, and is commonly referred to as vitamin A deficiency.

## 4 Potential Underlying and Proximate Contributors to Nutritional Status in Southeast Asia

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 of Immediate, Underlying, and Basic Causes

#### Immediate

- Dietary intake of iron, zinc, folate, and vitamin A is low in the diets of many Southeast Asian women.
- The duration of exclusive breastfeeding is very short in the countries examined, particularly in Burma, the Philippines and Vietnam, with Cambodia having the longest median duration of exclusive breastfeeding (4.5 months).
- Only 2 in 5 infants begin breastfeeding within the first hour of life in Laos, while the majority of infants in Timor Leste and Burma begin breastfeeding within the first hour of life (82% and 76%, respectively).
- Of the countries examined, introduction of solid/semi-solid food in Vietnam is the most delayed (only half of children are consuming such food by 6–8 months of age) and dietary diversity is lowest in Cambodia (only about a third of children under 2 years are eating from a minimum of four food groups daily). Feeding frequency is the most inadequate in Laos (37% of breastfed children receive the minimum number of meals per day).
- Vietnam demonstrates the highest proportion of children under 2 meeting minimum requirements for both dietary diversity and feeding frequency (52%) and Cambodia the lowest (28%).
- Diarrhea affects more children under 5 in Cambodia and Timor Leste than in the other five countries examined.
- Adequate use of iron supplements during pregnancy is not common in the Southeast Asian countries examined, with the maximum coverage with 90 days of iron supplements the highest in Cambodia (57%).
- Vitamin A supplementation coverage among children under 2 ranged from 35% in Burma to 85% in Vietnam. Data on iron supplementation among children are scant; 2%, 20%, and 37% of children under 5 in Cambodia, Timor Leste, and the Philippines, respectively, received iron supplements in the week prior to the survey.
- Postpartum vitamin A supplementation coverage was highest in Burma (66%) and lowest in Laos (18%). Coverage in the remaining countries was between 32 and 56%.
- Adequately iodized salt coverage is lowest in Vietnam (45%) and Burma (47%), compared to 84% of households in Cambodia.

- Basic vaccination coverage of children by 12 months of age is lowest in Vietnam and Laos, and highest in Burma.

#### Underlying

- Food security is of greatest concern in Timor Leste where, according to the Global Hunger Index, there are alarming levels of hunger and 20% of households are food insecure.
- There is a wide range of water, sanitation, and hygiene access and practices across the countries examined. Timor Leste and Cambodia have the lowest proportion of households with access to an “improved” source of drinking water and to “improved” hygienic toilets/latrines. Vietnam and the Philippines have the highest levels of access to “improved” drinking water and Vietnam and Burma have the highest levels of access to “improved toilets.”

#### Basic

- The status and education of women in the seven Southeast Asian countries is generally higher than that seen in South Asia, and adolescent marriage and childbearing is much less common. Education levels of women are lowest in Laos and Timor Leste and adolescent pregnancy is most common in Laos, followed by Indonesia.
- Several countries in Southeast Asia have histories of violence and political upheaval (some, like Timor Leste, more recently than others), which in some cases has caused insecurity, damage to infrastructure, and weak governance due to new systems.
- Many countries in Southeast Asia are prone to natural disasters and the effects of climate change, which has implications for food security, population displacement, landlessness, and disease.
- Despite major success in the reduction of poverty in most of the countries (except for Timor Leste), these gains have not been universally seen within each country and malnutrition still disproportionately affects those in the lowest wealth quintile.

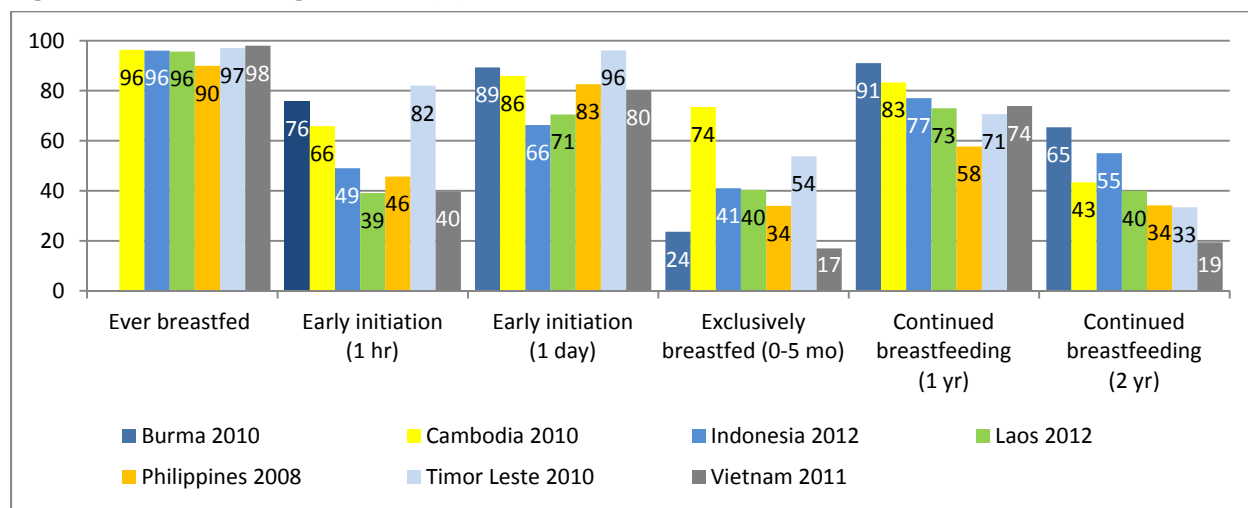
## Immediate

**Infant feeding practices.** Breastfeeding and complementary feeding practices are important determinants of child malnutrition. In most of the Southeast Asian countries examined, less than half of children under 6 months of age are exclusively breastfed (see **Figure 12**), and in the Philippines and Vietnam, the median duration of exclusive breastfeeding is extremely short—between 0.5 and 0.7 months. Cambodia has the greatest proportion of infants 0–5 months who are exclusively breastfed (74%) of the seven countries examined, followed by Timor Leste (54%) while Vietnam (17%) and Burma (24%) have the lowest. Early initiation of breastfeeding, which is important for prevention of neonatal morbidity and mortality, is lowest in Laos, where only 2 in 5 infants start breastfeeding within the first hour of life (slightly over two-thirds of infants in Laos have started breastfeeding during the first day of life). In contrast, 82% of infants in Timor Leste and 76% of infants in Burma begin breastfeeding within the first hour of life.

In terms of complementary feeding, Indonesia and the Philippines have the greatest proportion of children 6–8 months who received solid/semi-solid food (91%) compared to Vietnam, where only half of infants were consuming solid/semi-solid food by this age (see **Figure 13**). The proportion of children under 2 whose diets meet minimum standards for dietary diversity is lowest in Cambodia (37%) and highest in

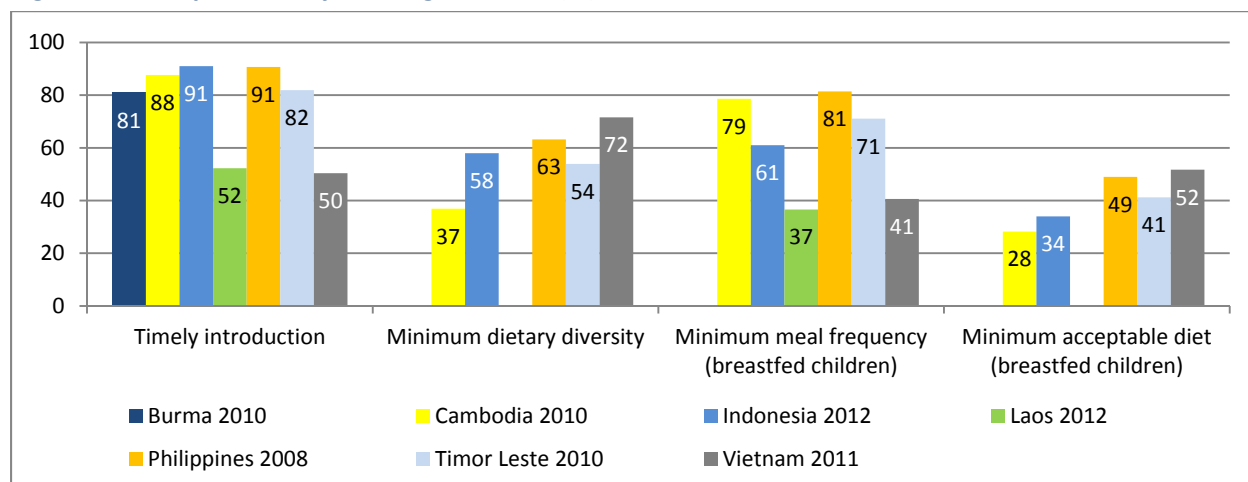
Vietnam (72%). Vietnam also has the greatest proportion of children under 2 whose diets meet minimum standards for both feeding frequency and dietary diversity (52%).

**Figure 12. Breastfeeding Practices (%)**



Note: For percentage ever breastfed and percentage with initiation of breastfeeding in first hour/first day, data for Timor Leste reflect births in the past 5 years and data for Vietnam reflect births in the past 3 years (standard indicator is births in the past 2 years).

**Figure 13. Complementary Feeding Practices (%)**



Note: Vietnam data for minimum dietary diversity are from National Institute of Nutrition et al. 2010 and minimum acceptable diet did not indicate whether it referred to only breastfed infants.

**Dietary intake (including supplements and fortified food).** Dietary diversification (e.g., increasing intake of animal-source food or vitamin A-rich fruits and vegetables), supplementation, and fortification are three primary ways to ensure an adequate intake of micronutrients. Women in low-resource settings are at risk of not meeting their nutrient requirements due to monotonous and low quality diets, and the risk is greater for pregnant and lactating women whose nutritional needs are higher. In a review of studies assessing micronutrient intake among women in South and Southeast Asia, Latin America, and sub-Saharan Africa, intake of iron, zinc, folate, and vitamins A and C were most frequently below recommended intake levels among studies from Asia (Torheim et al. 2010). In the Philippines and Timor-Leste, for which recent nationally-representative data on dietary intake among women of

reproductive age are available, the proportion of women who consumed vitamin A-rich fruits and vegetables in the previous 24 hours was 84% and 88%, respectively. About half of women in Timor Leste consumed meat/fish/poultry or eggs (52%) in the previous 24 hours; in contrast, consumption from this same food group was nearly universal (91%) among women in the Philippines. The mean number of food groups (a minimum of 0 to a maximum of 9)<sup>6</sup> consumed by women was 3.8 in Cambodia (in 2005), 3.7 in Indonesia (in 2007), and 4.7 in the Philippines (in 2008) (Kothari and Abderrahim 2010).

In terms of supplement use, coverage of postpartum vitamin A supplementation was highest in Burma (66%) and lowest in Laos (18% as of 2006) (see country nutrition profiles). While the proportion of women reporting *any* iron supplementation use in pregnancy was fairly high in Cambodia (87%), Burma (84%), and the Philippines (81%), use of at least 90 days of iron supplements during pregnancy was not (only 57% of women in Cambodia and 34% of women in the Philippines met this minimum recommendation). Vitamin A supplementation among children under 2 was lowest in Burma (35%, in contrast to its results for postpartum vitamin A supplementation, which was nearly double) and highest in Vietnam, where 85% of children under 2 years received vitamin A supplements in the 6 months prior to the survey. Data on iron supplementation among children are scant; 2%, 20%, and 37% of children under 5 in Cambodia, Timor Leste, and the Philippines, respectively, received iron supplements in the week prior to the survey.

Fortification of salt with iodine has been the main vehicle for reducing iodine deficiency globally. Of the seven Southeast Asian countries examined, all have passed national legislation mandating salt iodization with the exception of Vietnam and Timor Leste, the latter of which has draft legislation for mandatory salt iodization (Begin and Codling 2013). However, the coverage of households with adequately iodized salt in the seven countries examined varies widely. The proportion of households consuming adequately iodized salt ranges from a low of 45% in Vietnam and 47% in Burma<sup>7</sup> to a high of 84% of households in Cambodia.

**Disease.** Vaccination coverage of children under 2 ranges widely across the seven Southeast Asian countries examined, from a low of 31% of children 12–23 months of age in Vietnam who received all basic vaccinations<sup>8</sup> by 12 months of age (as of 2011) to a high of 89% of similarly aged children in Burma (as of 2009–2010) (see **Table 2**). In Vietnam, vaccination coverage for individual vaccines was higher (for example, 91% of children received their first dose of polio vaccine, 95% received BCG, and 93% received their first dose of DPT) although coverage declined after the first dose for those vaccines with multiple doses. In addition, lower maternal education, lower household wealth, and households with heads who are part of an ethnic minority group had lower immunization rates. Vaccination coverage, in contrast, is consistently high throughout Burma across regions and population groups, with no significant differences between rural/urban areas, levels of maternal education, or wealth quintiles, according to the Myanmar MICS 2009–2010.

<sup>6</sup> The food groups used were: starchy staples, legumes and nuts, dairy, organ meat, other meat, eggs, dark-green leafy vegetables, vitamin A-rich fruits and vegetables, and other fruits and vegetables.

<sup>7</sup> There is conflicting information on salt iodization in Burma. The 2013 Ministry of Health Nutrition Promotion document indicates that households with adequately iodized salt has fallen dramatically to only 47% of households in 2008 having adequately iodized salt, however a UNICEF report mentions that 93% of households in 2007 had adequately iodized salt.

<sup>8</sup> Basic vaccinations by 12 months of age (as defined by WHO) include: one dose of BCG, three doses each of Diphtheria/pertussis/tetanus (DPT) and polio, and one dose of measles vaccine. DPT may be alternatively administered as a pentavalent vaccine (along with Haemophilus influenzae type b and Hepatitis B) or tetravalent vaccine (with Haemophilus influenzae type b).

Of common childhood infections, diarrhea is most strongly associated with reduced linear growth (Black et al. 2013) and in severe cases can cause dehydration and death in young children. The prevalence of diarrhea among children under 5 in the 2 weeks prior to the survey was highest in Cambodia and Timor Leste (approximately 15%; see **Table 2**). Not coincidentally, Cambodia and Timor Leste demonstrated the lowest access to hygienic toilet/latrine facilities of the seven countries (see **Table 3**).

Fever in young children can be a manifestation of malaria in areas where malaria is endemic. While portions of all of the Southeast Asian countries examined in this report have malaria transmission areas, malaria incidence has been decreasing (however, inconsistent data prevent establishment of trends for Burma and Indonesia) (WHO Global Malaria Programme 2012). All of Timor Leste is a malaria-transmission area, whereas in Vietnam, 38% of its population lives in transmission areas. Of the four countries with data on fever incidence, fever was most common in Cambodia and Indonesia affecting approximately 1 in 3 children in the 2 weeks prior to the survey (see **Table 2**).<sup>9</sup> In Indonesia, the most common causes of fever in children are malaria (61% of the Indonesian population lives in malaria-transmission areas [WHO Global Malaria Programme 2012]), respiratory and intestinal infections, measles (74% of children between 12–23 months of age received measles vaccine in 2012), and typhoid. In Cambodia, among children under 5 with fever, a very low percentage (0.3%) took antimalarial treatment; a higher percentage, 44.3%, took antibiotics. Cambodia had the highest proportion of children under 5 with acute respiratory infections in the 2 weeks prior to the survey.

## Underlying

**Food security.** Timor Leste has the greatest proportion of people (38%) whose food intake falls below minimum energy requirements, a proportion defined as “very high” by the Food and Agricultural Organization of the United Nations (FAO) (see **Table 3**). Laos has the next highest proportion (27%), and along with the Philippines (16%), these three countries are not on target to meet Millennium Development Goal 1 of reducing the proportion of people suffering from hunger by 2015 (FAO 2012). Indonesia and Vietnam have the lowest proportions (9 and 8% respectively) of their population who are considered undernourished by FAO standards. There are very limited data on the food security situation in Burma.

**Water, hygiene, and sanitation.** Across the seven countries of interest, there is a fairly wide range of household access to “improved” sources for drinking water,<sup>10</sup> from about two-thirds of households in Timor Leste and Cambodia (during the dry season) to close to all households in Vietnam (although variations exist within countries—for example, urban versus rural areas—which is not captured in overall national estimates) (see **Table 3**). The percentage of households using an appropriate treatment method for drinking water<sup>11</sup> is also quite variable from country to country, with the lowest percentages in Burma and the Philippines and the highest in Timor Leste and Vietnam. Access to “improved” hygienic toilet/latrines,<sup>12</sup> important for preventing gastrointestinal infections including dysentery, diarrhea, and typhoid, only reaches a third of the total population in Cambodia, and in rural areas, only reaches a

<sup>9</sup> The Timor Leste DHS 2009–2010 was fielded during half of the malaria season (November to May), thus the prevalence of fever may be higher during those 7 months.

<sup>10</sup> “Improved” sources of drinking water include: water piped into dwelling/yard/plot, public tap/standpipe, tube well or borehole, protected well, protected spring, rain water, or bottled water.

<sup>11</sup> Appropriate water treatment methods include boiling, bleaching, straining, filtering, and solar disinfecting.

<sup>12</sup> Classification of a household’s toilet facility as hygienic or “improved” indicates that it effectively separates human waste from human contact. The types of facilities most likely to accomplish this are flush or pour flush toilets (into a piped sewer system or septic tank); pit latrines; ventilated improved pit latrine; pit latrine with a slab; or a composting toilet. Private facilities (used only by household members) are also considered more hygienic than shared ones.

quarter of the population, with 66% of rural households in Cambodia practicing open defecation. Of the seven countries, Burma and Vietnam have the greatest proportion of households with access to private hygienic toilet/latrine facilities (85 and 74% respectively). In terms of handwashing practices, 87% of households in Vietnam and 92% of households in Indonesia have water and soap for handwashing (no other national surveys presented handwashing data).

## Basic Causes

**Maternal health, education, and social status.** The proportion of women receiving antenatal care from a medically-trained provider was above 90% in Indonesia, the Philippines, and Vietnam (see **Table 2**). A slightly lower, but still high, percentage of women delivered with a skilled provider in Indonesia (83%) and Vietnam (93%), while the proportion in the Philippines was significantly lower (62%). Education levels of women are higher than what is seen in some countries in South Asia, with significantly lower proportions of women having no education—between 1.2% in the Philippines and 29.3% in Timor Leste. Adolescent marriage and pregnancy is also less common in Southeast Asia than it is in South Asia. The median age at first marriage in Southeast Asia ranges between 19.2 and 22.2 years (of the five Southeast Asian countries with recent data) and median age at first birth ranges between 21.1 to 23.2 years of age. Laos has the highest percentage of adolescent births (19% of women delivering their first child by 18 years of age) followed by Indonesia (16%). Of the five countries for which there are data, Vietnam has the lowest percentage of women who have begun childbearing by age 19 (7.5%) compared to Cambodia, Indonesia, the Philippines, and Timor Leste where the percentages are around 20–25%. Across the four countries with recent data, indicators of decision-making authority among women appear to be lowest in Timor Leste, where only about 1 in 5 women have sole decision-making authority over their own health care. Measures of gender inequality rank Vietnam as the most “gender equal” of the seven Southeast Asian countries and Indonesia as having the greatest gender inequality (see **Table 3**).

**Poverty.** Timor Leste reports the greatest percentage of the population living below the national poverty line at around 50%. Although not comparable (the indicator differs between countries), both Indonesia and Vietnam report much lower percentages of their populations living below the national poverty line at 11% and 17% respectively. Laos has the highest percentage of its population living below US\$1.25 per day at 34% compared to Indonesia and Vietnam which report 16% and 17% respectively (see **Table 3**; data were not available for Timor Leste). Both Indonesia and Vietnam have met the Millennium Development Goal of halving the proportion of people whose income is less than a dollar a day and Laos and Cambodia are on track to meet that goal by 2015. Burma, Timor Leste, and the Philippines are not on track.



**Table 2. Characteristics of Women of Reproductive Age (15–49 Years): Education, Employment and Empowerment, Fertility, Health Care Access and Utilization, and Child Health Vaccination Coverage and Illness**

	Burma (MICS 2010)		Cambodia (DHS 2010)		Indonesia (DHS 2012)		Laos (LSIS 2012)		Philippines (DHS 2008)		Timor Leste (DHS 2010)		Vietnam (MICS 2011)	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
<b>Education of women 15–49 years of age (highest level attained) versus men</b>														
% with no education	6.7	N/A	15.9	7.8	3.3	2.9	26.1 <sup>1</sup>	N/A	1.2	N/A	29.3	19.4	9.2 <sup>2</sup>	4.1 <sup>2</sup>
% with some or completed primary education	39.4	N/A	49.4	41.2	33.2	37.5	41.8 <sup>1</sup>	N/A	19.5	N/A	22.9	25.7	33.3 <sup>2</sup>	29.5 <sup>2</sup>
% with some or completed secondary education	51.2	N/A	34.7	51.0	51.4	47.7	30.9 <sup>1</sup>	N/A	79.2	N/A	47.8	55.0	57.5 <sup>2</sup>	66.3 <sup>2</sup>
<b>Employment and empowerment of women 15–49 years of age</b>														
% employed in the past 12 months	N/A		80.8	86.9	63.3	99.2	N/A		56.5	N/A	43.7 <sup>3</sup>	87.3 <sup>3</sup>	82.2	83.2
% with sole decision-making authority over their own earnings	N/A		67.7		65.3		N/A		41.4		36.4		N/A	
% with sole decision-making authority over their own health care	N/A		45.1		34.0		N/A		49.6		22.8		N/A	
<b>Fertility</b>														
Median age (years) at first marriage (women 25–49 years)	7.4% of women 15–19 married		20.3		20.4		19.2		22.2		20.9		N/A	
Median age (years) at first birth (women 25–49 years)	N/A		22.3		22.0		21.1		23.2		22.4		N/A	
% of women (20–49 years) who gave birth by 18 years of age	N/A		9.0		15.9		19.4 (of women 15–49 years)		8.7		12.5		3.9 (of women 15–49 years)	
% of women 15–19 years who have begun childbearing by 19	N/A		25.5		24.1		N/A		24.1		20.3		7.5	
Total fertility rate	2.0 <sup>4</sup>		3.0		2.6		3.2		3.3		5.7		2.0	
<b>Family planning, reproductive health, and maternal mortality</b>														
% of currently married women using a “modern” family planning method	N/A <sup>5</sup>		34.9		57.9 (of married women 15–49)		42.1		33.9		29.9		59.8	
% of currently married women using a “traditional” family planning method	N/A		15.7		4.0		7.7		16.7		2.5		17.9	
% of women with a live birth in the past 5 years receiving antenatal care from a “medically-trained” or “skilled” provider <sup>6</sup>	83.1 <sup>7</sup>		89.1		95.7		54.2 <sup>7</sup>		91.1		86.0		93.7 <sup>7</sup>	
% of women with a birth in the past 5 years who delivered in a health facility	36.2		53.8		63.2		37.5 <sup>7</sup>		44.2		22.1		92.4 <sup>7</sup>	

	Burma (MICS 2010)	Cambodia (DHS 2010)	Indonesia (DHS 2012)	Laos (LSIS 2012)	Philippines (DHS 2008)	Timor Leste (DHS 2010)	Vietnam (MICS 2011)
% of women with a birth in the past 5 years who delivered with a “medically-trained” or “skilled” provider <sup>6</sup>	70.6	71.0	83.1	41.5 <sup>7</sup>	62.2	29.9	92.9 <sup>7</sup>
Maternal mortality ratio (deaths/100,000 live births) (2010 adjusted) <sup>4</sup>	200	79	220	470	99	300	59
<b>Child health: vaccination, illness, utilization of health services, and mortality rates</b>							
% of children 12–23 months of age with basic vaccinations by 12 months of age <sup>8</sup>	88.6	73.6	59.9	34.0	79.5	47.2	31.3
% of children under 5 with symptoms of acute respiratory infection in the previous 2 weeks	2.6 <sup>9</sup>	6.4	5.1	3.3 (suspected pneumonia)	5.2	2.1	3.3 (suspected pneumonia)
% of children under 5 with symptoms of acute respiratory infections in the previous 2 weeks taken to health care provider/facility for advice/treatment	73.6 <sup>10</sup>	64.2	75.3 <sup>11</sup>	54.4	50.0	71.0	73
% of children under 5 with diarrhea in the previous 2 weeks	9.1	14.9	14.3	10.0	9.0	15.6	7.4
% of children under 5 with diarrhea taken to a health care provider/facility for advice/treatment	N/A	58.9	64.6	N/A	34.2	72.2	N/A
% of children under 5 with a fever in the previous 2 weeks	N/A	28.1	31.0	14.2	22.4	19.2	16.4
% of children under 5 with a fever taken to a health care provider/facility for advice/treatment	N/A	62.8	73.5	N/A	39.3	72.8	N/A
Neonatal mortality rate (0–4 years before survey)	N/A	27	19	32 <sup>12</sup>	16	22	N/A
Infant mortality rate (0–4 years before survey)	37.5	45	32	68 <sup>12</sup>	25	45	14 <sup>13</sup>
Under-5 mortality rate (0–4 years before survey)	46.1	54	40	79 <sup>12</sup>	34	64	16 <sup>13</sup>

<sup>1</sup> Source: Laos 2006 MICS

<sup>2</sup> Source: 2005 Vietnam Population and AIDS Indicator Survey

<sup>3</sup> Among married women/men 15–49 years

<sup>4</sup> Source: World Bank, 2013, “World Development Indicators” (<http://data.worldbank.org/data-catalog/world-development-indicators>)

<sup>5</sup> 45.7% of ever-married women 15–49 years are using (or partner is using) a contraceptive method

<sup>6</sup> The definition of “medically-trained” and/or “skilled” provider for antenatal and delivery care varies by country. See country profiles for country-specific information

<sup>7</sup> Data refer to % of women 15–49 years with birth in the past 2 years

<sup>8</sup> Basic vaccinations by 12 months of age (as defined by WHO) include: one dose of BCG (TB), three doses each of diphtheria/pertussis/tetanus/polio, and one dose of measles vaccine

<sup>9</sup> Children under 5 who had symptoms of pneumonia during the 2 weeks preceding interview

<sup>10</sup> Children under 5 who had symptoms of pneumonia during the 2 weeks preceding interview who were taken to an appropriate provider

<sup>11</sup> Excludes pharmacy, shop, and traditional practitioner

<sup>12</sup> Data are for only 1 year prior to the survey

<sup>13</sup> Refers to the time period around mid-2009

**Table 3. Country Characteristics: Population, Economy, Development, Food Security, Dietary Diversity and Water, Sanitation, and Hygiene**

	Burma	Cambodia	Indonesia	Laos	Philippines	Timor Leste	Vietnam
<b>Population, birth, and death rates</b>							
Population (July 2013 estimate) <sup>1</sup>	55,167,330	15,205,539	251,160,124	6,695,166	105,720,644	1,172,390	92,477,857
% of population 0–14 years of age (2013 estimate) <sup>1</sup>	27	31.7	26.6	35.5	34	42.7	24.6
% urban population (2010) <sup>1</sup>	34	20	44	33	49	28	30
Population growth rate, % (2013 estimate) <sup>1</sup>	1.05	1.67	0.99	1.63	1.84	2.47	1.03
Birth rate (per 1,000 population) (2013 estimate) <sup>1</sup>	18.89	24.88	17.38	25.23	26.62	34.85	16.56
Death rate (per 1,000 population) (2013 estimate) <sup>1</sup>	8.05	7.88	6.31	7.86	4.95	6.28	5.94
<b>Economy</b>							
Gross domestic product (GDP) (current US\$, 2011) <sup>2</sup>	N/A	12.8 billion	846.8 billion	8.3 billion	224.8 billion	1.1 billion	123.6 billion
GDP per capita (current US\$, 2011) <sup>2</sup>	N/A	897	3,495	1,320	2,370	896	1,407
Health expenditures % of GDP (2011) <sup>2</sup>	2.0	5.7	2.7	2.8	4.1	5.1	6.8
Education expenditures % of GDP (2010) <sup>2</sup>	0.8 (2011)	2.6	3.0	3.3	2.7	10.1	6.6
% of population below national poverty line (2008-2013) <sup>3</sup>	25.0 <sup>4</sup>	20.5	11.4	27.6	25.2	49.9	17.2
% of population below US\$1.25 per day (2008-2011) <sup>5</sup>	N/A	18.6	16.2	33.9	18.4	N/A	16.9
Purchasing power parities (PPP) conversion factor, local currency unit to international dollar <sup>5</sup>	542.08	2201.46	5704.67	4546.88	28.23	0.71	10879.11
<b>Development</b>							
Human Development Index (HDI) (2012) <sup>6</sup>	0.498	0.543	0.629	0.543	0.654	0.576	0.617
HDI ranking (out of 187 countries) <sup>6</sup>	149	138	121	138	114	134	127
Gender inequality index (GII) (2012) <sup>7</sup>	0.437	0.473	0.494	0.483	0.418	N/A	0.299
GII ranking (out of 148 countries) <sup>7</sup>	80	96	106	100	77	N/A	48
<b>Food Security</b>							
Global Hunger Index (2013) <sup>8</sup>	No data	16.8 (serious)	10.1 (serious)	18.7 (serious)	13.2 (serious)	29.6 (alarming)	7.7 (moderate)
% of households with poor or limited food consumption (food insecure)	No data	11.1 <sup>9</sup>	No data	11.0 <sup>10</sup>	No data	20.0 <sup>11</sup>	No data
Proportion undernourished in total population (%) (2011 - 2013) <sup>12</sup>	No data	15.4	9.1	26.7	16.2	38.3	8.3
Food supply (kcal/capita/day) (2009) <sup>13</sup>	2,493	2,382	2,646	2,377	2,580	2,076	2,690
Depth of food deficit (kcal/capita/day) (2011–2013) <sup>12</sup>	No data	102	64	195	100	254	91
<b>Dietary Diversity<sup>12</sup></b>							
% of dietary energy supply from cereals, roots, and tubers (2008–2010)	No data	74	67	73	60	72	61
Average supply of protein from an animal source (grams/capita/day) (2008–2010)	No data	18	16	14	26	15	29

	Burma	Cambodia	Indonesia	Laos	Philippines	Timor Leste	Vietnam
<b>Water, Sanitation, and Hygiene<sup>14</sup></b>							
% of population using “improved water source” for drinking water	82.3	58.3 (dry season); 78.6 (rainy season)	74.5	69.9	88.8	63.3	92
% of population using appropriate treatment method for drinking water	34.5	74.1	70.6	53.2	29.1	82.8	89.6
% of population using “improved/not shared” toilet/latrine	84.6 <sup>9</sup>	35.4 <sup>15</sup>	69.2 <sup>16</sup>	59.2	66.9 <sup>15</sup>	41.3	73.8

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

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

<sup>3</sup> 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

<sup>4</sup> Source: Ministry of National Planning and Economic Development 2011a

<sup>5</sup> Source: Millennium Development Goals Indicators (<http://mdgs.un.org/unsd/mdg/Data.aspx>); data are from the most recent year available

<sup>6</sup> Source: UNDP’s HDI database (<http://hdrstats.undp.org/en/indicators/103106.html>)

<sup>7</sup> Source: UNDP’s GII database (<http://hdrstats.undp.org/en/indicators/68606.html>)

<sup>8</sup> Source: von Grebmer et al. 2013

<sup>9</sup> Source: WFP 2008

<sup>10</sup> Source: WFP and Federal Ministry of Economic Cooperation and Development 2013

<sup>11</sup> Source: WFP 2006

<sup>12</sup> Source: FAO 2013, “Statistics: Food Security Indicators,” Available at <http://www.fao.org/economic/ess/ess-fs/fs-data/en/#.UwY1EvdXTo>

<sup>13</sup> Source: FAOSTAT (<http://faostat3.fao.org/faostat-gateway/go/to/browse/FB/FB/E>)

<sup>14</sup> Data from most recent nationally available source

<sup>15</sup> Compilation of all improved, non-shared facilities

<sup>16</sup> Percentage using “private toilet” (with or without a septic tank)

## 5 Overall Nutrition Priorities for Seven Countries in Southeast Asia

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### Priority 1: Wasting and Stunting Among Children

Continued and strengthened long-term multifaceted efforts are needed to reduce levels of stunting. Efforts that focus on primary postnatal determinants such as infant and young child feeding (IYCF) practices and disease need to be accompanied by parallel activities to detect and manage wasting, particularly among children under 12 months of age (and in several countries, among children under 6 months of age).

In the Southeast Asian countries examined, while the relative contribution of prenatal and postnatal factors to stunting and wasting varies between countries, suboptimal IYCF practices are a strong determinant of stunting and wasting universally across the region, particularly early initiation of breastfeeding, low levels of exclusive breastfeeding, and insufficient feeding frequency and dietary diversity. Although tackling chronic and acute malnutrition has been largely dichotomized programmatically in the past, integrated approaches may serve to benefit one another (for example, “preventive” actions to reduce stunting, such as improving exclusive breastfeeding practices and maternal nutrition, will also help in lowering wasting). In five of the seven countries examined (Cambodia, Indonesia, Laos, the Philippines, and Vietnam), wasting is highest among children under 12 months of age, and in most cases among children under 6 months of age. Thus, strategies to detect and manage acute malnutrition in this particularly vulnerable group are needed. As poor IYCF practices likely underlie early levels of wasting (as well as later increases in stunting), linking acute malnutrition detection with breastfeeding support through community-based programs and counseling should help to provide more comprehensive nutrition services. Effective nutrition-specific interventions to address stunting and wasting during infancy and childhood include the following.

- **Support of optimal IYCF practices.** Early breastfeeding practices—including early initiation, and maintaining exclusivity—as well as the dietary diversity and feeding frequency of complementary feeding diets need to be particularly improved in most Southeast Asian countries examined. In countries where facility births are higher, support to (or reinvigoration of) the Baby-Friendly Hospital Initiative should help with initiation and exclusive breastfeeding rates. 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 (Bhutta et al. 2013). Provision of complementary foods along with education have also been effective in improving attained height and weight in food insecure populations (Bhutta et al. 2013).
- **Disease prevention and management.** Improved vaccination coverage (in particular in Indonesia, Laos, Timor Leste, and Vietnam), improved access to health services and health care-seeking behaviors for treatment of common childhood illnesses, greater coverage of deworming of children, malaria prevention efforts in transmission areas, and education on infant feeding during illness are all important strategies of reducing infection/disease.
- **Micronutrient supplementation.** Even with greater dietary diversity, achieving recommended levels of particular nutrients (e.g., iron, zinc, calcium, and vitamin A) is particularly difficult for infants and young children and supplementation (or home fortification approaches such as micronutrient powders or lipid-based nutrient supplements) are warranted to prevent deficiency and promote adequate growth and development.

- **Management of moderate and severe acute malnutrition.** Community-based services to detect and manage acute malnutrition, particularly among infants, are needed. Training health workers/volunteers in appropriate IYCF practices, disease management, and how to detect wasting using mid-upper arm circumference should help provide more comprehensive nutrition services for this vulnerable group.

In addition, basic causes of malnutrition will need to be improved through nutrition-sensitive interventions to make nutrition-specific interventions most effective. In Southeast Asia, improving sanitation levels (access to safe water, hygienic facilities, and practices for disposing solid waste), raising maternal education levels (especially in Cambodia, Laos, and Timor Leste), and strengthening health systems and improving capacity to deliver nutrition services in most countries are key factors.

## Priority 2: Nutrition of Women of Reproductive Age and Low Birth Weight

In many Southeast Asian countries significantly greater attention and support is needed to improve nutrition of women of reproductive age and reduce LBW, including, in some countries, ensuring that preventive actions are in place to prevent overweight/obesity. Greater attention also includes addressing significant data gaps in the nutritional status of women of reproductive age (especially in Burma, Indonesia, and Laos).

Stunting is already high (20% or more) during the first 6 months of life in Indonesia, Laos, and Timor Leste, and wasting is highest among children under 6 months of age in Cambodia, Indonesia, the Philippines, and Vietnam. LBW and maternal malnutrition are likely strong contributors to early development of wasting and stunting in these countries (LBW is highest in the Philippines and maternal underweight highest in Timor Leste). In contrast, LBW is low in Vietnam, pointing to other factors such as poor IYCF practices and disease being stronger determinants of wasting at very young ages. The relative unimportance given to maternal nutrition is reflected in the lack of data on the nutritional status of this group in several countries, including Burma, Indonesia, and Laos. Improvement of the nutritional status of women of reproductive age is important for more than just improving child nutrition indicators, but also for improving quality of life and reducing maternal morbidity and mortality. Early nutrition is also fundamental for preventing overnutrition in later life; in most countries examined, overweight and obesity are on the rise (especially in the Philippines and Indonesia). The following nutrition-specific interventions should improve nutritional status of women of reproductive age and improve birth weight.

- **Multiple micronutrient supplementation during pregnancy (including folic acid, iron, and calcium).** Education and counseling around supplementation during pregnancy, which is commonly underutilized (even if available) in part due to fears of large babies and thus dangerous births, should be provided to adolescent and expectant mothers, but also to the community as a whole to encourage supplement use.
- **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 reaches as high as 1 in 2 women in the Southeast Asian countries examined.

Understanding and addressing the root causes of anemia, which include nutrient deficiencies in addition to iron deficiency, as well as infections such as malaria or hookworm, is crucial to reduce these numbers.

- **Preconception family planning and adequate birth spacing.** Some countries in Southeast Asia need greater emphasis on birth spacing and access to family planning services, most notably the Philippines and Timor Leste. Incorporating nutrition interventions into reproductive health programs to improve preconception nutritional status may help to have even greater impact on birth outcomes and child nutritional status.
- **Ensuring access to and coverage of skilled attendants 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 immunization" as well as nutrients to newborns, decreasing morbidity and mortality. Active management of the third stage of labor to prevent postpartum hemorrhage may also improve postpartum anemia and iron status by preventing excessive blood loss.
- **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).

Nutrition-sensitive and basic determinants of maternal malnutrition in Southeast Asia also need to be addressed. These include pregnancy in adolescence, access and utilization of health services, low education of women, food taboos or dietary restrictions during pregnancy and lactation, high fertility, and discrimination toward women.

### Priority 3: Anemia and Micronutrient Deficiencies

Assessing the causes of high levels of anemia among children under 2 and women of reproductive age 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 high levels of anemia among these groups in Southeast Asia. Interventions to reduce micronutrient deficiencies such as iron, zinc, vitamin A, and iodine also require continued or greater support in some countries. Data on particular micronutrient deficiencies that are associated with anemia in countries where anemia prevalence is high are also needed.

Anemia warrants a particular emphasis in many countries in Southeast Asia due to high rates among pregnant women (reaching 71% in Burma) and children under 2 (78% in Cambodia). A recent analysis estimated that roughly 17% of anemia among pregnant women and 21% of anemia among children under 5 in Southeast Asia would be improved by iron supplementation alone (Black et al. 2013) indicating that a much larger proportion of anemia has other nutritional or non-nutritional causes that need to be identified. Other micronutrient deficiencies likely play a role—including vitamin A, B6, B12, folic acid, and riboflavin—and comprehensive multi-micronutrient supplementation (or home fortification) of particular groups (infants and young children and pregnant women) is likely needed. Other micronutrient deficiencies such as iodine have largely been addressed through salt iodization, but some countries—namely Vietnam, Burma, and Timor Leste—need strengthening of policies and/or enforcement. Because anemia and micronutrient deficiencies are largely "invisible," as is the damage they cause (until it is too late), preventive approaches are essential. In addition, greater communication and awareness is needed to educate consumers, as well as service providers, and increase demand for and utilization of preventative

and treatment services. Interventions to address anemia and micronutrient deficiencies include the following.

- **Increasing sources of bioavailable iron in the diet of 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 levels among these high iron need groups. Among women, improving preconception iron status as well as iron-folate/multiple micronutrient supplementation during pregnancy will also lower rates of LBW (Bhutta et al. 2013).
- **Addressing other micronutrient deficiencies that can cause anemia.** Vitamins A and B (B6, B12, riboflavin, and folate) may also play a role in the etiology of anemia and approaches similar to those for increasing iron intake (dietary diversification, supplementation, or universal/home fortification) are needed. Vitamin A supplementation coverage for postpartum women and young children can also be strengthened in many countries.
- **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 preventative treatment for pregnant women 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) play a large role in anemia levels in Cambodia and potentially other Southeast Asian countries. The extent of their contribution to overall anemia levels should be assessed.
- **Addressing other country-specific micronutrient deficiencies.** Vitamin A deficiency remains a significant concern in Burma, Cambodia, and Laos. Ensuring vitamin A supplementation coverage of women and children as well as dietary diversification and fortification strategies should help to increase vitamin A status. Vietnam, Timor Leste, and Burma would benefit from strengthened salt iodization policy and enforcement to address iodine deficiency; coverage of households with adequately iodized salt needs to be improved in the Philippines, Vietnam, and Burma; and iodine levels should be monitored in Cambodia and Indonesia for excess.

#### Priority 4: Nutrition Governance

Across the seven South Asian countries examined, nutrition governance could be improved through strengthening capacity to deliver nutrition services, creating unified visions of malnutrition and its causes and remedies, encouraging and sustaining political commitment to reduction of malnutrition, supporting timely and regular data collection of globally-recommended nutrition indicators, and improving coordination of reduction efforts.

Across the seven South Asian countries examined, the following challenges to achieving strong nutrition governance were identified.

- **Improve and strengthen capacity to deliver quality nutrition services.** Several of the countries examined (Indonesia and the Philippines in particular) have a strongly decentralized



health system, which places the responsibility for planning, implementing, and monitoring nutrition services at the lowest levels of government, where technical skills for these tasks are not adequate. Other countries' delivery of services is hampered by a weak and sparse health system, such as in Laos, or new systems/policies due to recent establishment of government as in Timor Leste. Overall health system strengthening as well as improved capacity in nutrition and program planning and evaluation skills are needed.

- **Creation of a unified vision of what malnutrition is, why it exists, and how it is solved.** A lack of understanding what malnutrition is, what the primary forms of concern are in each country, and what causes them has been raised as a reason for insufficient action on the part of policymakers. For example, in Indonesia malnutrition has been viewed primarily as an issue of wasting and in Timor Leste malnutrition until recently was seen as sufficiently addressed through poverty alleviation alone. Maternal nutrition does not figure in as strongly in the collective view of malnutrition problems in many countries and needs strengthened advocacy.
- **Encouraging and sustaining political commitment to reduce malnutrition at the highest levels of government.** Even in Vietnam, which has shown the most dramatic decreases in stunting and underweight of the seven countries in this report, nutrition and breastfeeding were not seen as high priorities by policymakers (Alive & Thrive 2012). In other countries, such as Burma, although apparent political commitment is high, nutrition services have been routinely underfunded and overlooked, indicating the need for adequate finances to back political commitments.
- **Supporting regular and timely collection of globally-recommended indicators for maternal and child malnutrition.** A significant challenge in assessing the current nutrition situation as well as progress in many of the Southeast Asian countries examined is the lack of timely nationally-representative data. Data that are particularly lacking include: data on globally-recommended indicators of IYCF practices; data on the nutritional status of women of reproductive age (especially in Burma, Indonesia, and Laos); in some countries, child anthropometric indicators (e.g., Indonesia); food security data in Burma; and data on anemia in women and children and associated micronutrient deficiencies.
- **Improved coordination.** Particularly for countries that have endorsed a multisectoral plan of action to address nutrition, coordination of efforts, particularly between government sectors as well as between levels of government, has arisen as a key challenge to overcome.

## 6 Recommendations for Southeast Asia

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In Southeast Asia, the U.S. Government and USAID have invested in nutrition to varying degrees. Of the countries reviewed, Cambodia, Indonesia, the Philippines, and Vietnam had significant funding for health programs and activities in fiscal year 2013, but only Indonesia and Cambodia had funds allocated for nutrition. For all the other countries, no direct funds for nutrition were allocated. Across this region however, there are opportunities to further leverage and strengthen the nutrition focus of existing projects. There are also significant opportunities to expand nutrition interventions.

Burma, Laos, Indonesia, the Philippines, and Vietnam have joined the SUN Movement, and this is an opportunity for USAID to align with these efforts and further bolster them for greater impact on reducing malnutrition. A key focus in this region is on improving IYCF practices (with a focus on improving exclusive breastfeeding, diet diversity, and quality) and water, sanitation, and hygiene practices to improve nutrition and reduce infections. Several countries also need more expansive efforts on reducing acute malnutrition.

Cambodia, Indonesia, the Philippines, and Vietnam have USAID programs, and Cambodia also has a Feed the Future project. Projects and activities under these initiatives in these countries that have nutrition outcomes as their impact indicators could focus more on implementing direct nutrition interventions for their target population so that they are able to achieve these outcomes.

Overall, given the burden of malnutrition in these countries, expanding nutrition-specific interventions would help address key nutrition problems. In particular addressing suboptimal IYCF practices, reducing maternal underweight and low birth weight, and addressing high levels of anemia in both children under 2 and pregnant women are critical to reducing the continued high levels of stunting and wasting in much of Southeast Asia. Lastly, support is needed for stronger nutrition governance through advocacy for nutrition, capacity building in nutrition at lower levels of government, and support for multisectoral coordination (where applicable).

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## Appendix 1. Methods

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Nationally representative datasets and reports that included nutrition and health data of women and children (as well as socioeconomic and demographic data) were identified and downloaded for the seven countries examined in this report. The main sources of data used were DHS or 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 Indonesia and the Philippines). Several online databases were consulted for data as well. These include the 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 LBW; UNDP’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. The ICF Macro publication, *Nutrition Update 2010* was also consulted for IYCF indicator data (Kothari and Abderrahim 2010).

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. IYCF indicators were reported using standard definitions (2010 *Indicators for assessing infant and young child feeding practices: Part 2 Measurement*). 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 SUN 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 also 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 Children Under 2 and Children Under 5**

	Burma (2009–10 MICS)		Cambodia (2010 DHS)		Indonesia (2010 Report on Basic Health Research) <sup>10</sup>		Laos (2011–12 Social Indicator Survey) <sup>1</sup>		Philippines (2011 Nutritional Status Survey) <sup>2</sup>		Timor Leste (2009–10 DHS)		Vietnam (2011 MICS)	
	0–23 months	0–59 months	0–23 months	0–59 months	0–23 months	0–59 months <sup>10</sup>	0–23 months	0–59 months	0–23 months	0–59 months	0–23 months	0–59 months	0–23 months	0–59 months <sup>4</sup>
Incidence of LBW (%)	9		11 (2010) <sup>3</sup>		7 (2012) <sup>3</sup>		15		21 (2008) <sup>3</sup>		10 (2010)		5	
% underweight	16	22.6	19.7	28.3	14.4	18.6	25.2	26.6	16.6	20.2	33.5	44.7	8	11.7
% moderately underweight	11.6	17.0	15.3	21.6	10.5	14.2	16.8	19.4	12	15.8	21.5	29.3	6.9	9.9
% severely underweight	4.4	5.6	4.4	6.7	3.9	4.4	8.4	7.2	4.6	4.4	12	15.4	1.1	1.8
% stunted	24.4	35.1	28.5	39.9	34.9	39.2	36.4	44.2	20.2	33.6	49.3	58.1	16	22.7
% moderately stunted	16.1	22.4	19.7	26.3	15.8	19.5	22.8	25.4	14.1	23.2	20.6	25.2	11.8	16.7
% severely stunted	8.3	12.7	8.8	13.6	19.1	19.7	13.6	18.8	6.1	10.4	28.7	32.9	4.2	6
% wasted	8.8	7.9	13.8	10.9	14.9	12.3	10.4	5.9	10.6	7.3	18.6	18.6	5.1	4.1
% moderately wasted	6.4	5.8	10.8	9.3	8.3	6.9	8.2	4.5	7.1	4.9	11.2	13.9	3.7	2.9
% severely wasted	2.4	2.1	3	1.6	6.6	5.4	2.2	1.4	3.5	2.4	7.4	4.7	1.4	1.2
% anemic (Hb < 11 g/dL)	75 (under 5) <sup>9</sup>		78 (6–23 months)	55.1 (6–59 months)	No data	28.1 (12–59 months) <sup>5</sup>	63.5 <sup>6</sup>	41.2 <sup>7</sup>	66.2 (6–11 months)	36.3 (6–59 months)	53.4 (6–23 months)	38.2 (6–59 months)	45 <sup>8</sup>	29.2 <sup>8</sup>

<sup>1</sup> Data for children under 2 are from the 2006 MICS

<sup>2</sup> Results for children under 2 are from the 2008 7th National Nutrition Survey

<sup>3</sup> Source: Indonesia DHS 2012

<sup>4</sup> According to the National Institute of Nutrition's 2011 Review of the Nutrition Situation in Viet Nam 2009–2010, the percent of children under 5 who are underweight is 17.5%, the percent of children under 5 who are stunted is 29.3%, and the percent of children under 5 who are wasted is 7.1%

<sup>5</sup> Only refers to children 12–59 months. Source: Riskesdas 2013 (Research and Development Agency for Health and Ministry of Health)

<sup>6</sup> Source: Ministry of Health and UNICEF 2006

<sup>7</sup> Source: Lao PDR Multiple Indicator Cluster Survey 2006

<sup>8</sup> Source: 2009–2010 General Nutrition Survey

<sup>9</sup> Source: Ministry of Health, 2013, "Nutrition Promotion" (<http://www.moh.gov.mm/file/Nutrition%20Promotion.pdf>)

<sup>10</sup> Because the 2013 Riskesdas did not have data for children under 2, the data from the 2010 report are shown here for both age groups so that they can be compared (elsewhere in the report, the 2013 data are provided for children under 5)

**Table A.2. Nutritional Status of Women of Reproductive Age**

Indicator	Burma, 2001	Cambodia, 2010 DHS	Indonesia, 2013 <sup>3</sup>	Laos, 2006 <sup>5</sup>	Philippines, 2003 <sup>7</sup>	Timor Leste, 2010 DHS	Vietnam, 2009–2010 <sup>9</sup>
% underweight (BMI < 18.5 kg/m <sup>2</sup> )	No data	19.1	12 <sup>4</sup>	14.5	14.2	27.2	18.0 (20.6% of women with child under 5)
15–19 years	No data	28.3	22 <sup>4</sup>	N/A	N/A	33.4	N/A
20–49 years	No data	16.7	N/A	N/A	N/A	25.2	N/A
% overweight or obese (BMI ≥ 25 kg/m <sup>2</sup> )	No data	10.9	32.9	14.0	27.3	5.1	8.2
% short stature (< 145 cm)	No data	6.3	N/A	N/A	N/A	14.8	6.1 <sup>10</sup>
% anemic, all women 15–49 years (< 11 g/dL for pregnant women; < 12 g/dL for non-pregnant women)	44.9 of non-pregnant women <sup>1</sup> ; 71% of pregnant women <sup>2</sup>	44.4 (52.7 of pregnant women)	37.1 (of pregnant women)	36.2 <sup>6</sup> (women of reproductive age)	43.9 of pregnant women; 42.1 of lactating women <sup>8</sup>	21.3 (28% of pregnant women)	28.8 of non-pregnant women; 36.5 of pregnant women

<sup>1</sup> Source: UNSCN *6th Report on the World Nutrition Situation*, 2010

<sup>2</sup> Source: Ministry of Health 2013. <http://www.moh.gov.mm/file/Nutrition%20Promotion.pdf>

<sup>3</sup> Source: Riskesdas 2013 (Research and Development Agency for Health and Ministry of Health)

<sup>4</sup> Source: 2001 National Household Health Survey

<sup>5</sup> Source: WHO Nutrition Landscape Information System, available at <http://apps.who.int/nutrition/landscape/report.aspx?iso=LAO&rid=161&template=nutrition&goButton=Go>

<sup>6</sup> Source: MICS 2006 (as cited by WFP at <http://www.foodsecurityatlas.org/lao/country/utilization/childrens-women-nutritional-status>)

<sup>7</sup> Source: WHO Nutrition Landscape Information System, available at: <http://apps.who.int/nutrition/landscape/report.aspx?iso=PHL&rid=161&template=nutrition&goButton=Go>

<sup>8</sup> Source: 6th National Survey 2003 (as found in WHO Global Database on Anaemia at [http://who.int/vmnis/anaemia/data/database/countries/phl\\_ida.pdf](http://who.int/vmnis/anaemia/data/database/countries/phl_ida.pdf))

<sup>9</sup> Source: National Institute of Nutrition and UNICEF 2011

<sup>10</sup> Source: Alive & Thrive Baseline Survey Report, 2012

## 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"> <li>• Hb &lt; 12 g/dL in non-pregnant women of reproductive age</li> <li>• Hb &lt; 11 g/dL in pregnant women and children 0–59 months</li> </ul>
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"> <li>• Mid-upper arm circumference <math>\geq 110</math> mm and <math>&lt; 125</math> mm (the cutoff is being debated)</li> <li>• Weight-for-height <math>\geq -3</math> z-score and <math>&lt; -2</math> z-score of the median (WHO standards)</li> <li>• Weight-for-height as a percentage of the median <math>\geq 70\%</math> and <math>&lt; 80\%</math> (NCHS references)</li> </ul> <p>Moderate acute malnutrition can also be used as a population-level indicator defined by weight-for-height <math>\geq -3</math> z-score and <math>&lt; -2</math> z-score (WHO standards or NCHS references).</p>
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"> <li>• The presence of bilateral pitting edema</li> <li>• Severe wasting (mid-upper arm circumference <math>&lt; 110</math> mm) (cutoff being debated)</li> <li>• Weight-for-height <math>&lt; -3</math> z-score (WHO standards)</li> <li>• Weight-for-height <math>&lt; 70\%</math> of the median (NCHS references)</li> </ul> <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 <math>&lt; -3</math> z-score (WHO standards).</p>

Term	Definition
Small for gestational age	Refers to when an infant has intrauterine growth restriction and is below the 10 <sup>th</sup> percentile of the recommended gender-specific birth weight for gestational age reference curves.
Stunting	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.
Undernutrition	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.
Underweight	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.
Wasting	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.

