

NUTRITION IN BHUTAN: SITUATIONAL ANALYSIS AND POLICY RECOMMENDATIONS

DISCUSSION PAPER

DECEMBER 2014

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Health, Nutrition & Population

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Health, Nutrition and Population (HNP) Discussion Paper

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Health, Nutrition and Population (HNP) Discussion Paper

Nutrition in Bhutan: Situational Analysis and Policy Recommendations

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Abstract: As Bhutan has progressed financially, its health indicators have also progressed. It has achieved significant gains in all the Millennium Development Goals (MDGs). Yet two major indicators of significant undernutrition remain persistently elevated: stunting of children younger than 5, and anemia in women and children.

Some factors can be interpreted as direct or nutrition-specific determinants of undernutrition in Bhutan, among them diarrheal diseases, high parasite loads in parts of the country, and a very high prevalence of *Helicobacter pylori* infections. Other, more indirect, factors can be considered nutrition-sensitive, such as diseases related to environmental and personal hygiene. The most important causes of stunting are indirect and nutrition-sensitive: poor nutrition and care of women before and during pregnancy as reflected in the profound female anemia rates.

Beyond factors that directly impact on the nutrition of women and children are other issues specific to Bhutan: many villages and settlements are inaccessible, some at altitudes that strongly influence crop selection and production; a dependency on imported foods makes the country vulnerable to price fluctuations; ethnic and other cultural variables influence access to services and alter feeding practices; urban migration is further impinging on a decreasing agrarian work force; communities are not aware of the nutrition problems of stunting and anemia and have no understanding of their causes, their significance, and what could be done to remediate them; and there are few people knowledgeable about public nutrition who have the skills needed to educate and motivate changes in community behavior.

The report conclusions highlight four major public nutrition problem areas, and to focus government actions, suggests five priorities from the sector-specific recommendations because they are considered most feasible and would lead to immediate gains in reducing

undernutrition—gains that could then draw attention and support to the problem of undernutrition in Bhutan.

Keywords: Bhutan, health, stunting, nutrition, malnutrition, poverty, food security, the World Bank

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GLOSSARY OF KEY TERMS

The definitions below are derived from *Repositioning Nutrition as Central to Development* (Shekar 2006); the definition of body mass index is from the U.S. Centers for Disease Control.¹

- *Malnutrition*: This term covers all forms of bad nutrition, including underweight, stunting, overweight, and obesity, although the term *undernutrition* is increasingly used to specify the type of malnutrition that is due to a lack of food or nutrients. Among the forms of malnutrition are the following:
- *Chronic undernutrition (stunting)*: Failure to reach linear growth potential because of inadequate prenatal and postnatal nutrition or poor health. Chronic undernutrition implies long-term undernutrition and poor health and is measured as height-for-age that is two z-scores (a measure of the distance in standard deviations of the score from the mean) below the international reference as defined by the World Health Organization. For children under 12 months, recumbent length is used instead of height.
- *Acute malnutrition (wasting)*: Weight (in Kgs divided by the square of their height (in meters) that is two z-scores below the international reference. Acute malnutrition describes a recent or current severe process leading to significant weight loss, usually a consequence of acute starvation or severe disease. It is often used as an indicator of undernutrition among children and is especially useful in emergency situations when food supplies are compromised.
- *Underweight*: Low weight for age such as two z-scores below the international reference. Underweight implies stunting or wasting and is an indicator of undernutrition.
- *Overweight*: Excess weight relative to height. Overweight in adults is usually measured by body mass index (BMI). A BMI > 25 indicates overweight, and > 30 obesity.
- *Body mass index*: A person's body mass (in kg) divided by the square of their height (in meters); the formula used is $BMI = \text{mass (kg)} / \text{height (m}^2\text{)}$. Although indirect, BMI is a measure of adult body fat that can be used to identify both under- and overweight; BMI < 18.5 indicates underweight. Charts are used for cut-off points for over- and underweight for children and growing adolescents.
- *Nutrition-specific interventions* are those that bring about a direct improvement in nutritional status (for example, breastfeeding, vitamin and mineral supplements, disease prevention).
- *Nutrition-sensitive interventions* have an indirect effect on nutritional status by impacting underlying contributors to undernutrition (for example, keeping girls in secondary school to avoid adolescent pregnancies, improvements in personal and environmental hygiene through

¹ See http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html#Definition accessed 12 May 2013.

water and sanitation initiatives, etc.).

- *Clinical nutrition and dietetics*, which include food science and research, is the branch of nutrition associated with health care services to individuals, usually conducted in an institution. It relates to public health nutrition as clinical medicine relates to public health.
- *Public health nutrition* administers the nutrition component of public health services to entire populations; usually conducted as part of community health services.
- *Public nutrition* deals with upstream multisectoral influences on nutritional status. Usually it applies more to nutrition-sensitive interventions than to public health nutrition, which is more concerned with nutrition-specific interventions.

ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
BHU	Basic Health Unit
BMI	Body Mass Index
BMIS	Bhutan Multiple Indicator Survey
DHS	Demographic Health Survey
DOPH	Department of Public Health
DOTS	Directly Observed Therapy, Short Course
EBF	Exclusive Breast Feeding
ECCD	Early Childhood Care and Development
EPI	Expanded Programme on Immunization
FNS	Food and Nutrition Section, Ministry of Health
FP	Family Planning
FYP	Five-year Plan
GAVI	Global Alliance for Vaccines and Immunizations
GDP	Gross Domestic Product
GFATM	Global Fund for AIDS, TB, and Malaria
GNH	Gross National Happiness
GNHC	Gross National Happiness Commission
GNI	Gross National Income
HA	Health Assistant
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
IBFAN	International Baby Food Action Network
IEC	Information, Education, and Communication
IMCI	Integrated Management of Childhood Illness program
IMNCI	Integrated Management of Newborn and Childhood Illnesses
IYCF	Infant and Young Child feeding
JD	Job Description
LBW	Low Birth Weight
LNS	<i>Lancet</i> Nutrition Series
MCH	Mother and Child Health
MDG	Millennium Development Goal
MMR	Maternal Mortality Ratio
MoAF	Ministry of Agriculture and Forests
MoE	Ministry of Education
MoH	Ministry of Health
NCD	Non-communicable Disease
NCG	Nutrition Core Group
NCWC	National Commission for Women and Children
NNS	National Nutrition Survey

NSB	National Statistics Bureau
ORS	Oral Rehydration Solution
PAB	Protection at Birth
PHES	Public Health Engineering Section
PRC	People's Republic of China
RDTC	Rural Development Training Center
RGOB	Royal Government of Bhutan
RIHS	Royal Institute of Health Sciences
RNR	Renewable Natural Resources
RWSS	Rural Water Supply and Sanitation
SBA	Skilled Birth Attendant
SEARO	Southeast Asia Regional Office (WHO)
STH	Soil-transmitted Helminthes
SUN	Scaling Up Nutrition (movement)
TT	Tetanus Toxoid
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
VAD	Vitamin A Deficiency
VHW	Village Health Worker
VVCP	Vegetable Value Chain Programme
WDI	World Development Indicators
WFP	World Food Programme
WHO	World Health Organization

EXECUTIVE SUMMARY

Bhutan has managed to preserve its national identity despite an abrupt entry into the global community in 1999 with the advent of television and the Internet, and the institution of a constitutional monarchy with democratic elections in 2008. As articulated in 1972 by the former King of Bhutan, Jigme Singye Wangchuck, the philosophy that guides Bhutan's development has changed from gross national income to gross national happiness because the latter measure was considered more important than money and possessions. For the past two decades, Bhutan's economic growth has averaged 7.8 percent, having peaked at 19.8 percent in 2007 when the country began to export hydroelectric power. Bhutan is on track to halve the number of people living below the national poverty line by 2015.

As Bhutan has progressed financially, its health indicators have also progressed. It has achieved significant gains in all the Millennium Development Goals (MDGs) and is on target to achieve the health related goals. With decreases in infant mortality, now at 47 deaths per 1,000 live births, and under-5 mortality at 69 per 1,000 live births, the country is on target to achieve MDG 4. The maternal mortality rate (MMR) is also falling rapidly; the current 180–200 deaths per 100,000 live births is within reach of the MDG 5 target of 100. With regard to MDG 1, Bhutan has reduced underweight by more than half, from 38 percent in 1990 to 12.7 percent in 2010.

Yet two major indicators of significant undernutrition remain persistently elevated: stunting of children younger than 5, and anemia in women and children. Stunting prevalence is 33.5 percent; anemia affects 54.8 percent of women and 80.6 percent of children—among the highest rates in the world.

These figures are alarming for two reasons: they have persisted for many years (although stunting has dropped from 40 percent to 30 percent [using the older National Center for Health Statistics standards] in the past decade, anemia has hardly decreased since 1988); and they are of even more concern when inequalities of gender, geography, poverty, and ethnicity are taken into account. Furthermore, as Bhutanese migrate to the cities in search of jobs and education, less physical exercise and higher consumption of high-density and high-calorie processed foods are likely to have contributed to an increase in overweight and obesity in the country (Popkin 1999). The World Health Organization (WHO) estimates that 53.5 percent of Bhutanese women are now overweight with signs of the additional burden of malnutrition reflected in rising cholesterol and fasting blood sugar levels.

Related nutrition-specific and nutrition-sensitive indicators of concern are the low rates of children weighed at birth, particularly those from the lower economic quintiles, and higher rates of low birth weight in the poorest populations; a persistent problem with alcohol consumption, and its association with domestic violence; low levels of exclusive breastfeeding at four months as well as six; prevalence of adolescent pregnancies as high as 24 percent in some areas—which correlates with fewer girls in higher secondary school in the same areas; and the persistent practice of open defecation despite a remarkably successful national program promoting toilets in all households.

Some factors can be interpreted as direct or nutrition-specific determinants of undernutrition in Bhutan, among them diarrheal diseases, high parasite loads in parts of the country, and a very high prevalence of *Helicobacter pylori* infections. Other, more indirect, factors can be considered nutrition-sensitive, such as diseases related to environmental (open defecation) and personal hygiene (lack of hand-washing with soap with water close to toilets). Such diseases, among them tropical enteropathy, are linked to undernutrition through malabsorption or diversion of nutrients for uses other than growth. In addition, sporadic food insecurity affects some remote areas for up to four months every year, and a lack of dietary diversity due to poverty, climate, or education cause imbalances in the intake of nutrients needed for normal growth.

The most important causes of stunting are indirect and nutrition-sensitive: poor nutrition and care of women before and during pregnancy as reflected in the profound female anemia rates. Also, although 77 percent of women have at least four antenatal care (ANC) visits and 64.5 percent report skilled birth attendance, the high MMR raises questions about the quality of the care provided. Other indirect causes, supported by some data but requiring further investigation, may be the association of domestic violence with both maternal mortality and anemia; high culturally accepted rates of alcohol consumption even during pregnancy; the feminization of farming, leading to higher workloads for women throughout pregnancy and after the birth and possible shortages in the calories and nutrients available for appropriate fetal growth; and the relative disempowerment of adolescent girls and young women.

Beyond factors that directly impact on the nutrition of women and children are other issues specific to Bhutan: many villages and settlements are inaccessible, some at altitudes that strongly influence crop selection and production; a dependency on imported foods makes the country vulnerable to price fluctuations; ethnic and other cultural variables influence access to services and alter feeding practices; urban migration is further impinging on a decreasing agrarian work force; there is an internal and external brain drain of educated Bhutanese who cannot find jobs locally; communities are not aware of the nutrition problems of stunting and anemia and have no understanding of their causes, their significance, and what could be done to remediate them; and nationally and in districts and communities there are few people knowledgeable about public nutrition who have the skills needed to educate and motivate changes in community behavior.

Recognizing that greater knowledge and awareness of public nutrition is needed, this study investigated programs that have potential to impact on public nutrition in health, agriculture and forests, education, and rural water supply and sanitation (RWSS). Two things stood out: (1) the enormous extent of these programs and their relevance to improving nutrition; and (2) the enormous opportunity each offers to intensify the nutrition content—an opportunity that is not yet fully taken advantage of. This review identified training opportunities that could readily incorporate content on public nutrition, among them Early Childhood Care and Development, already a cross-over health and education program; community management organizations that take part in RWSS programs; school health clubs and peer helper programs; the Rural Development Training Centre of the Ministry of Agriculture and Forests, which trains young people and farmers; training programs for agriculture extension workers to emphasize that food is

essential but not sufficient for nutrition security; and programs of the Ministry of Health, such as the Expanded Program on Immunization; training of health assistants, midwives and other skilled birth attendants; outreach workers for directly observed therapy; and personnel in the HIV program and the Integrated Management of Newborn and Childhood Diseases. Each of these programs has staff members working in the same villages and often with the same community workers but who rarely coordinate their visits, which reduces their efficiency and effectiveness.

This report advances conclusions that highlight four major public nutrition problem areas:

1. Individuals and communities need more emphasis on nutrition and care of women, pregnant or not.
2. There is a need to significantly augment the public nutrition knowledge of the workforce and for better health care job descriptions with necessary competencies defined.
3. In the organizational structure, there is need for a mandate for intersectoral coordination and for defining and monitoring roles and accountabilities, and for a better nutrition monitoring system to see whether programs and personnel are succeeding.
4. In the policy and legal environment that enables work to be done to improve nutrition, there is a need to give nutrition much greater visibility as the driving factor behind future national economic and intellectual development—a call, in fact, for public nutrition to be continued as a government priority in all planning processes.

Each of the recommendations that follow is crafted to fill a major gap detected through this analysis. Some recommendations are at the policy level; some are as pragmatic and local as changing the quality of the iron tablets to make weekly supplements more palatable to schoolgirls. Interventions are defined as short-, medium-, and long-term. Each has a different impact horizon, short-term from two to three years to up to 10 years for long-term. Each, however, must be started immediately to promote synergies, use time efficiently and effectively, and produce immediate as well as sustainable changes.

To focus government actions on the most urgent problems, five priorities were chosen from the sector-specific recommendations because they are considered most feasible and would lead to immediate gains in reducing undernutrition—gains the government could then use to draw attention and support to the problem of undernutrition in Bhutan:

1. Because school girls currently find the iron supplement to be unpalatable, a change to a newer, more palatable formulation that can be readily sourced needs to be explored. It would also be beneficial to expand weekly iron/folate supplementation to girls and women aged 15–25 to improve their nutritional status before they become pregnant. Bhutan could also consider extending iron supplements to lactating women through the first two years after pregnancy.
2. The government could do a rapid market analysis of rice imports and of the domestic rice and oil industry to establish the feasibility of fortifying these foods. Market surveys to determine consumer acceptance of double-fortified salt would also be necessary.
3. Delivery of nutrition-specific and nutrition-sensitive interventions is perceived to be fragmentary. The entities delivering interventions could define an evidence-based

package of nutrition interventions that can be made available for each citizen and also identify process and output monitoring indicators can be integrated into the health management information system.

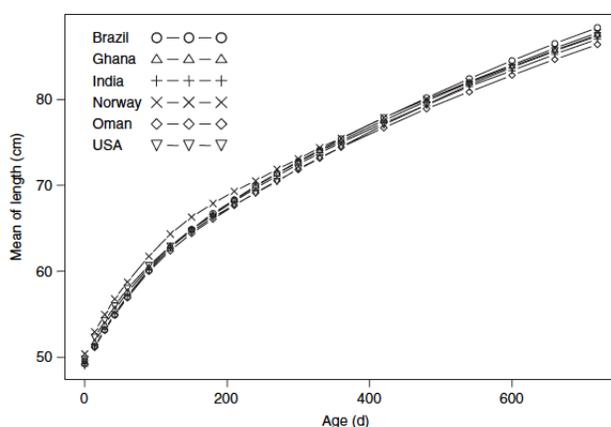
4. To raise community awareness of the nutrition problems identified in this study's focus group discussions, the government should organize a biannual *Community Nutrition and Happiness Day* that is planned and implemented jointly by staff from Health, Education, Agriculture, and RWSS. The multisectoral Nutrition Core Group could be made responsible for coordinating this initiative.
5. To reduce high rates of adolescent pregnancy and low rates of contraceptive use, the ministries of Health and Education could work together to design a comprehensive life-skills education course on adolescent reproductive and sexual health as part of the school curriculum and also increase access to contraceptives for both girls and boys.

1 INTRODUCTION

BACKGROUND: CHANGING CONCEPTS

With the advent of television and the Internet in 1999, the institution in 2008 of a constitutional monarchy with democratically instituted elections, and a burst of economic growth in the last decade, Bhutan opened itself up to global influences that changed the expectations and practices of its citizens. In the process, it shifted its objectives from gross national income (GNI) to gross national happiness (GNH), an idea that the former King of Bhutan, Jigme Singye Wangchuck, articulated in 1972 as the philosophy that would guide Bhutan's development.

Figure 1.1: Growth of Children of Six Nations over time

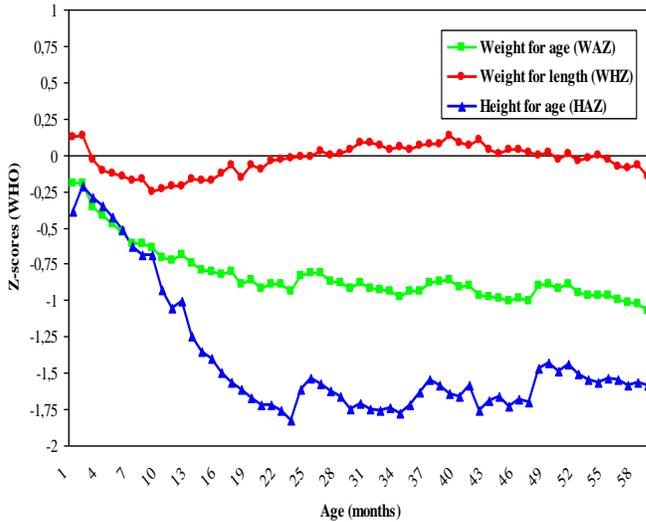


Source: Onis 2006.

Good nutrition for Bhutan's citizens is necessary for good health, and that requires a multisectoral approach. Nutrition is part of the self-assessment of health in the measure of GNH but is not addressed specifically as a domain (Ura 2012). This could suggest that either nutrition is considered a crosscutting issue affecting mental health, education, living standards, etc., or the importance of nutrition as being vital to personal and national development is not fully recognized. That the latter may be true is supported by the findings of the 2008 National Nutrition, Infant and Young Child Feeding Survey, which found that "health indicators have improved over the past two decades...[but] despite all of these improvements, 30 percent of Bhutanese children continue to remain stunted or undernourished" (FNS 2008).

Stunting (low height for age) is so common in Bhutanese villages, where more than one in three children are stunted, that some people consider it to be a Bhutanese trait. The reformulated World Health Organization (WHO) growth standards for children showed that under ideal conditions of nutrition and health, all children, regardless of geographical location or national identity, grow essentially the same for the first two years (figure 1.1;(Onis 2006). Deviations from the curve, as in Bhutan, result not from the innate nature of being Bhutanese but from socioeconomic and cultural practices that affect the nutritional status of women and children there.

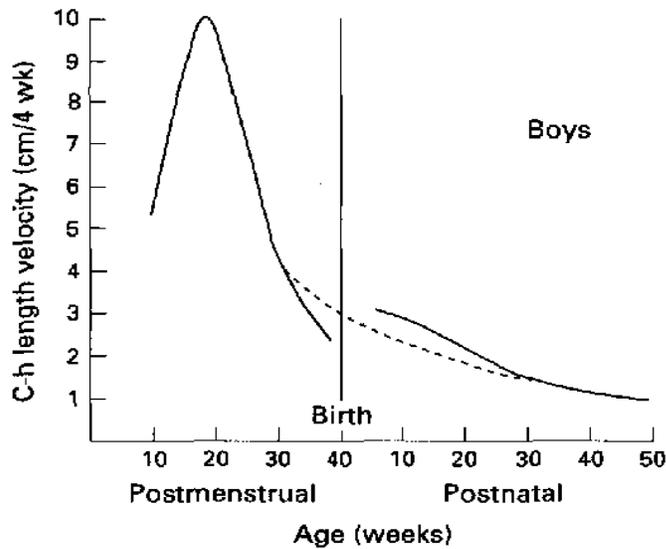
Figure 1.2: Timing of Growth Faltering



Source: C.G. Victora et al. 2010

weeks of gestation) could explain why stunting, in some analyses, was associated with poor intellectual and school performance (Dobbing 1974; Winick 1971).

Figure 1.3: Intrauterine Growth Spurt in Crown-Heel Length



Sources: Falkner et al. 1994; Tanner 1990; Winick 1971

interventions to improve the long-term nutrition of the child can be most effective. Beyond this window, stunting and its long term effects are largely irreversible. For example, there is little that can be done nutritionally to fully correct short stature.

The global nutrition community’s understanding of the causes of stunting changed in 2001 (Shrimpton et al. 2001) and were reinforced in 2010 (C.G. Victora et al. 2010) by the finding that rather than following a period of chronic underweight in a child, stunting can actually be present at birth (figure 1.2). This suggests that stunting has a different cause than underweight and wasting and has a prenatal component (figure 1.3) (Falkner et al. 1994; Tanner 1990). The finding that the growth spurt in brain cell development occurs at the same time as the spurt in linear growth (that is, from conception to the first 14–16

The new data expanded the idea that prenatal and postnatal nutrition were integral to each other and that the contributions of the intrauterine and early postnatal period (first two years of life) to reduced adult stature were equally important (Li et al. 2003). Put simply, if the nutrition and health of the mother in early pregnancy (and by implication pre-pregnancy) establishes the potential for her child’s ultimate adult stature, the child’s health and nutrition in the first two years of its life determine whether its full potential will be reached. This time period, from conception until 24 months of age, now known as the “window of 1,000 days” or “window of opportunity,” is a critical period during which

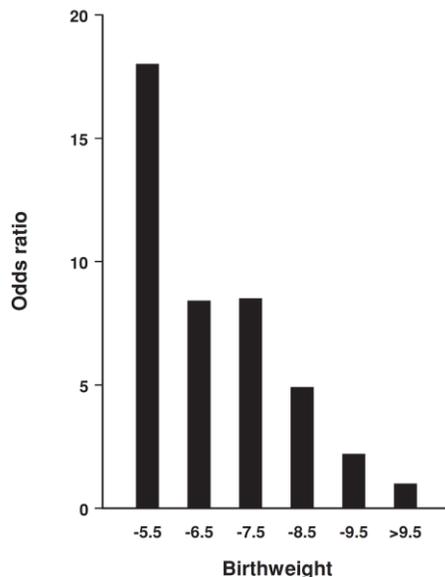
INTRAUTERINE MALNUTRITION: ADULT ONSET DISEASES

It is also clear that children who are malnourished *in utero* and born with low birth weight are predisposed to adult-onset diseases, including metabolic syndrome (a combination of risk factors for heart disease, diabetes, and cerebrovascular disease). Hales and Barker (2001) showed that the lower the birth weight the higher the likelihood of metabolic syndrome developing (figure 1.4). This factor is a major contributor to the double burden of malnutrition: the presence in the same community and even the same household of both under and over-nutrition. The burden drains government resources because among adults non-communicable diseases (NCDs) are chronic, expensive to treat, and lower the productivity of the country's workforce.

STUNTING: SIGNIFICANCE FOR CHILDREN AND WOMEN

Once it is understood how the first 1,000 days can affect stunting, the nutritional deficits of the mother before, during, and after pregnancy and of the child in its critical first two years become even more significant; it is now evident that they can not only lead to stunting but undermine cognitive development. Similarly, the association between nutritional deficits that impact linear growth and those that impact cognitive development *in utero* take on new significance. Adequate

Figure 1.4: Odds Ratio for the Metabolic Syndrome by Birthweight



Source: Hales and Barker 2001

nutrition through diet or supplements during this period can lead to taller adults, better performance of girls in school, higher scores on tests of intelligence and reading, higher incomes, and better linear growth (reduced stunting) in the next generation (C. G. Victora et al. 2008). A child of stunted height entering school is likely to complete eight months less schooling than a child of median height. This has an add-on effect: less schooling leads to 7–12 percent lower lifetime earnings (Alderman et al. 2006). And since by 2 years of age stunting is largely irreversible, a stunted girl becomes a stunted mother who has a higher risk of retarded growth of the fetus and of bearing a child who dies during the perinatal period (Dewey and Begum 2011; Lawn et al. 2009).

ANEMIA: SIGNIFICANCE FOR CHILDREN AND WOMEN

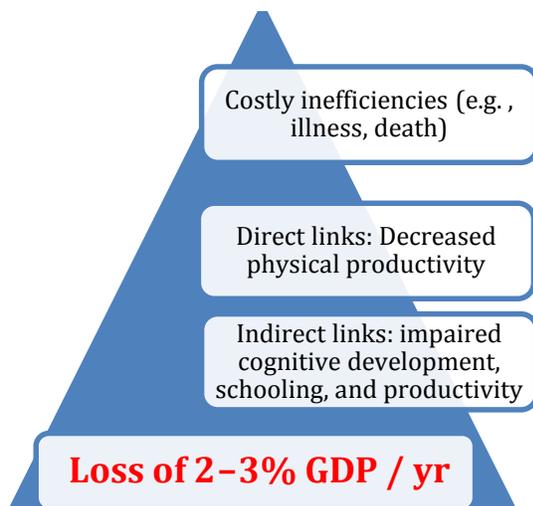
Anemia impacts the mother, the growth of the fetus, and the immunological and cognitive development of children. Cases of severe anemia in children can cause the loss of up to 25 IQ points (Lozoff et al. 2006); infants of anemic mothers have been found to have delayed developmental test scores (Perez et al. 2005). A woman who is iron-deficient when she first seeks

ANC has a three times higher risk of preterm delivery (L. H. Allen 2000). Estimates of the risks for the mother herself are equally significant: a study in Africa calculated that 20 percent of maternal deaths were associated with anemia (Hotez 2009).

ECONOMIC IMPACT OF MALNUTRITION

The economic impact of malnutrition has become more important for governments globally. *Repositioning Nutrition as Central to Development* (Shekar 2006) signaled a change in World Bank emphasis on the topic; simultaneously the 2004–05 Copenhagen Consensus published documents that clearly defined correction of malnutrition as one of the top investments to promote national development. A gathering of international expert economists in the 2004 Copenhagen Consensus project identified provision of micronutrients through a variety of mechanisms (for example, public health, agriculture, industry) as the second highest priority (after control of HIV/AIDS) to reduce both poverty and mortality losses across nations (Hunt 2005). This view was substantiated by Hoddinott, Rosegrant, and Torero (J Hoddinott et al. 2012) in a paper that, though emphasizing food security, reiterated that “bundled micronutrient interventions to fight hunger and improve education” were the number one investment to confront 10 of the world’s greatest challenges.

Figure 1.5: How Malnutrition Reduces Productivity



Source: Shekar 2006

productivity. Together, these can lead to a total loss to the economy of an average of 2–3 percent of GDP a year (Shekar 2006).

RATIONALE AND OBJECTIVES

The intent of the Bhutan National Nutrition Assessment and Gap Analysis was to generate evidence and create awareness among Bhutanese policymakers, program managers, government officials, and development partners of the importance of investing in the public nutrition system

to address malnutrition in the first 1,000 days, i.e., from conception through the first 24 months after birth. It is anticipated that the assessment can provide the basis for future operational and technical support from the World Bank and other development partners to fight malnutrition in Bhutan.

The objectives of the assessment were to review the size, severity, and determinants of undernutrition in Bhutan and evaluate current nutrition and nutrition-related programs in order to identify gaps and opportunities for scaling up.

The inordinately high degrees of stunting and anemia in Bhutan, their intransigence despite improvements in other markers of health and nutrition, and their importance to both individual and national development motivated the Royal Government of Bhutan to request this study in March 2012. The pervasiveness of the malnutrition problem points to multiple causes beyond simply food, touching on other aspects of the society that interfere with Bhutanese health and happiness despite all the efforts of a concerned government committed to providing free health care to all its citizens.

A recent measure of Gross National Happiness identified a score of 6.2 / 10 as the average happiness of Bhutan residents with both good health and access to health facilities, which those surveyed considered to be important sources of happiness. Bhutan is concerned with sustainable development, which it defines as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs,” and with achieving economic growth without compromising the well-being of its people. It sees this as possible by balancing the four pillars of GNH: sustainable and equitable socio-economic development, conservation of the environment, preservation and promotion of culture, and good governance (Tashi Tobgay et al. 2011b). Bhutan’s concept of happiness goes beyond the mere accumulation of wealth; it ranks well-being above riches, though economic development is still considered important. The ability to enjoy well-being depends on nutrition as well as health. This analysis makes it clear that the impact of malnutrition on human and economic development will reduce well-being and compromise the attainment of happiness in Bhutan.

2 METHODOLOGY²

ANALYTICAL APPROACH FOR THIS REPORT

Quantitative information for this report was gathered as secondary data through a systematic review of sources provided by Bhutan government ministries and departments and an extensive on-line search. Both published and unpublished documents were used. In some instances, primary data were re-analyzed for further correlations using Microsoft Excel and SPSS.

The qualitative study (using a grounded theory approach; Glaser and Strauss 1967) sampled communities in three different regions of Bhutan: Western, Central, and Eastern. Besides development indicators, sociocultural contexts in these regions also vary, usually due to terrain and climatic variations. To incorporate these diversities, within the three regions the study chose districts (*dzongkhags*) from three categories on the basis of their relative food security (secured, less secured and least secured). Six districts were selected: two from the first category, three from the second, and one from the third (see table 2.1). Food security levels (as measured by the Vulnerability Assessment Survey in 2005) were then used to select a village cluster (*geog*) from each district—food insecurity was one of the few relevant indicators available at the community level.

Table 2.1: Communities Sampled

District	Village Cluster	Characteristics of Village Cluster
Secured		
Thimphu	Chang	Region: West Population: 3,000 (approx.) Food insecurity rank: Least insecure
Bumthang	Chumme	Region: Central Population: 3,500 (approx.) Food insecurity rank: Least insecure
Less Secured		
Wangdue Phodrang	Theedtsho	Region: South Population: 2,500 (approx.) Food insecurity rank: More insecure
Tsirang	Tsholingkhar	Region: South-Central Population: 2,000 Food insecurity rank: More insecure
Haa	Uesu	Region: West Population: 2,500 Food insecurity rank: Less insecure
Least Secured		
Trashigang	Shongphu	Region: Extreme East Population: 3,000 (approx.) Food insecurity rank: Most insecure

² This section is based on primary qualitative research undertaken for the continuing Bhutan National Nutrition Assessment and Gap Analysis by a team from the Royal Government of Bhutan and the World Bank. Anuska Kalita and Rajshri Mahtani, consultants to the Bank, contributed to this section and have prepared a separate policy note (Kalita et al. 2014). For a more complete description of that study, please refer to the companion policy note on the study.

The main lines of inquiry for the study covered two categories of determinants of undernutrition: (1) factors related to the community, such as poverty, information asymmetry, and lack of awareness leading to suboptimal practices of child caring, feeding, and food practices for women, especially before and during pregnancy and after delivery; and (2) factors related to programs and systems for nutrition and health, such as problems of poor coverage, quality of services, or accessibility. Based on these lines of inquiry separate focus group discussion (FGD) guides were prepared for adolescent girls and young women, mothers, and mixed groups. The guides were piloted in field sites and all FGDs were transcribed.

Table 2.2: Selection Criteria of Participants of Focus Groups

S.No.	Group	Criteria and Description
1	Adolescent girls and young women	Age group: 13 to 25 years Girls/women who are not currently pregnant and who do not have children
2	Young mothers	Age group: below 25 years Women who currently have a child of 0-2 years, and/or are currently pregnant
3	Older mothers	Age group: 25-40 years Women who currently have a child of 0-2 years, and/or are currently pregnant
4	Mixed group	Age group: 18 years and above Both adult men and women

The FGDs were the main method of data collection for this study. They were conducted to enable participants to reflect on issues of concern so that interventions suited to the needs of the community could be identified. The groups were formed to represent women of varied ages and different socioeconomic groups.

The 24 FGDs consisted of four groups in each of the six areas sampled. Table 2.2 profiles FGD participants in each type of group. Groups ranged from a minimum of 6 to a maximum of 12 participants. All FGDs were facilitated in the local language or the dialect in which the participants were most proficient.

The government appointed seven field researchers from the ministries of Health and Education and the Gross National Happiness Commission. Each had a health and nutrition or a social development background and at least five years of experience in the government in a related area. Local village health workers and school teachers helped the researchers to mobilize the FGDs. The Ministry of Health issued circulars about the current nutrition assessment to all basic health units and district health officers eliciting their support. For the mother and mixed groups, the village health worker identified participants. For the adolescent girls and young women’s groups, the field team was supported by local schoolteachers and principals and by non-formal teachers and village leaders. This ensured that young women both in school and outside the school system were represented in the groups. The FGD groups met in community centers, village headmen’s offices, public schools, basic health units, and community *dzongs*—places participants could access easily.

Figure 2.1: Lines of Inquiry

- i. Gender relations in the household, the community and the society
- ii. Livelihood and economic profile of the communities
- iii. Food and nutrition security
- iv. Water security, safety and sanitation
- v. Food and nutrition related knowledge, attitudes, beliefs and practices
- vi. Health related knowledge, attitudes, beliefs and practices
- vii. Availability, accessibility and acceptability of public programs and services on health and nutrition

The qualitative data were organized into matrices for interpretation and analysis by theme and subtheme (figure 2.1). Organized and presented using the lifecycle approach, the data were tracked through thematic categories to generate propositions, conclusions, and recommendations.

ANALYSIS, PRESENTATION, AND VALIDATION

The Nutrition Core Group (NCG; see appendix A) validated the initial findings of the draft report, both quantitative and qualitative, through critical review of early drafts; NCG members represented ministries with programs that directly or indirectly relate to nutrition. Preliminary findings were also presented in a meeting chaired by the Director General of Public Health Services with participation of officials from Health and other ministries.

The analysis of the study was organized according to the UNICEF Nutritional Conceptual Framework (UNICEF 1990) in terms of proximate, underlying, and basic causes. The analysis also reflected the multisectoral approach of the Scaling Up Nutrition (SUN) movement, using the Window of 1,000 Days period from conception to 24 months to intensify the focus on pre-pregnant as well as pregnant women.

During interviews with informants from government ministries and departments, the useful distinction of “nutrition-specific” versus “nutrition-sensitive”³ interventions was used to illustrate how multisectoral programs and inputs could impact on the causes of malnutrition of women and children.

STRUCTURE OF THE REPORT

Because of the geopolitical importance of Bhutan’s position in South Asia and the changing and challenging dynamics of the geopolitical context—as well as the intriguing and innovative GNH philosophical vision—the report begins with a discussion of the country context, starting with historical relationships and similarities between Bhutan and its neighbors. There follow a section on economic growth and development that leads to a discussion of equity issues; descriptions of GNH and ethnic diversity, which is important even though the country is small, particularly for its impact on dietary habits; and finally, Bhutan’s advances toward achieving global goals, particularly the Millennium Development Goals (MDGs).

³ “Nutrition-specific” interventions are directed to the proximate causes of undernutrition (e.g., programs promoting food security, dietary diversity and quality, early and exclusive breastfeeding, micronutrient supplements, iodization of salt, deworming, and facility and community-based monitoring of children’s growth. “Nutrition-sensitive” interventions are directed at basic and underlying causes (e.g., programs to improve girls’ education, poverty reduction strategies, family planning and birth spacing, gender and equity, and access to safe water and improved sanitation).

The report then details Bhutan's major problems with malnutrition, of which stunting and anemia are of greatest concern to the government, as is a rising problem of overweight and obesity, mostly in urban centers, the rates of which are beginning to exceed regional averages. Related problems are low birth weight, alcohol consumption, sub-optimal levels of exclusive breastfeeding (EBF), and the problem of adolescent pregnancy—all issues that impact on nutritional indicators. To complete the situation analysis, the report also discusses micronutrients and environmental pathogens that affect the nutrition of women and children.

In analyzing the determinants of these problems, this report uses the Nutrition Conceptual Framework that UNICEF created in 1990. The analysis covers everything from immediate causes such as food availability and good health to underlying causes (food security, care of women and children, and a safe and hygienic environment) and finally basic causes (such nutrition-sensitive causes as education, gender, economics, and equity).

Of critical help in understanding the determinants of malnutrition in Bhutan is the primary data the study collected in 24 focus group discussions (FGDs). The rich qualitative data clarify how well communities understand malnutrition and how that affects behavior and practice.

The political economy section examines how government budget decisions affect nutrition and agriculture and government commitment to solving Bhutan's nutrition problems. It looks at government investment of both human and financial resources and its ability to initiate not only short-term solutions to human resource problems but also medium- and long-term solutions—solutions that require sustained political will and investment for up to 10 years. The report then describes current public nutrition-related programs, relates them to the problems described earlier, and identifies gaps and opportunities for improving nutrition in Bhutan.

The recommendations that follow are presented in two sections: the first would lead to immediate changes in the next two to five years. The second is a more extensive list, captured in sector-specific sections, to allow development partners and other stakeholders to see clearly what is being asked of them in the effort to take down barriers to full development for Bhutan and complete happiness for its people.

3 BHUTAN: COUNTRY CONTEXT

Despite its small area (38,394 sq km) and small population (716,896), this landlocked country has garnered international distinction for both its geopolitical position and its unique vision of governance, gross national happiness (GNH). By most measures, Bhutan has achieved universal health coverage through its National Health Service, which makes all citizens eligible for free public health services.

GEOPOLITICAL CONTEXT

Situated between the Tibetan plateau to the north and the plains of the Indian subcontinent to the south, Bhutan is sandwiched between very much larger China and India. Bhutan has therefore worked to protect and sustain its political and cultural sovereignty.

Bhutan has a close relationship with India, which surrounds it on three sides. The relationship with India reflects the geopolitical dynamics of British India up to 1947 and agreements signed with the newly independent India in the late 1940s and 1950s that established an economic aid program and major road projects linking central Bhutan to India. This close historical relationship explains the extensive trade between the two countries.

These historical determinants of Bhutan's identity and sovereignty must be understood in the context of Bhutan as a young country in terms of its recent development. It was not until the Third Druk Gyalpo, His Majesty Jigme Dorji Wangchuck, took the throne in 1952 that Bhutan began its transformation into a modern nation. In the late 1950s and early 1960s, the King introduced modern education, a national assembly, high courts, currency, banking, and a postal system. The first five-year plan was introduced in 1961. In 1963, a road from the capital, Thimphu, to India was completed.

The fourth King of Bhutan, His Highness Jigme Singye Wangchuck (ruled 1972–2006), also introduced significant political reforms. In 1999 Bhutan opened itself up to television and the Internet, and in 2005 it introduced a new constitution. In December 2005, the King announced that he would abdicate the throne and be succeeded by his son, His Majesty Jigme Khesar Namgyel Wangchuck. He also announced the first national parliamentary elections, which were held in December 2007 and March 2008. Bhutan thus exemplifies a remarkably orderly and nonviolent transition from absolute to constitutional monarchy.

ECONOMIC GROWTH AND DEVELOPMENT

Bhutan's record on growth and development has made it a top performer in South Asia. From 2008 through 2011 it experienced average annual GDP growth of 7.8 percent, following a double-digit burst from 6.4 percent in 2006 to 19.7 percent in 2007 when it began to export hydroelectric power (GNHC 2011). Bhutan, which has GDP per capita of about US\$2,000, is now classified as a lower-middle-income country. Still, the government considers its 23 percent poverty rate to be too high and projected it to be below 15 percent in 2013.

Among the most notable features of Bhutan’s macro economy is its lack of diversification, dependence on and exposure to external developments, and unusual year-to-year volatility in economic growth. However, sustained investment in the social sectors has enabled Bhutan to make remarkable progress. As will be seen later, the country has achieved or is on track to achieve many of the MDGs. But there are now questions about the future trajectory of social investment because of continued pressures on aggregate demand, the need for a steeper rise in social spending, economic constraints associated with debt sustainability, potential overheating of the economy, the uncertainty of donor support, rising citizen expectations, and capacity constraints.

EQUITY ISSUES

Although the decrease in the Gini index from 46.83 in 2003 to 38.06 in 2007 (WorldBank 2008) is evidence that income distribution is becoming more equitable, the general perception nevertheless seems to be that disparities are increasing. Moreover, national figures may obscure local realities. Poverty remains high in the east and south and in rural areas generally (NSB 2007a). Literacy shows a divide between higher- and lower-income groups and between rural and urban residents (NSB 2004). The World Development Indicators for 2007 recorded poverty levels in rural areas at 30.9 percent and in urban areas at 1.7 percent (WorldBank 2012a). Although this was an improvement—in 2003 38 percent of rural and 4.2 percent of urban residents suffered from poverty (Drukpa et al. 2005)—the difference is still obvious. Not surprisingly there is more malnutrition in impoverished rural areas. However, to say that malnutrition only affects the poor is to ignore the inordinately high levels of childhood anemia: at 80 percent, rich and poor, urban and rural are all affected.

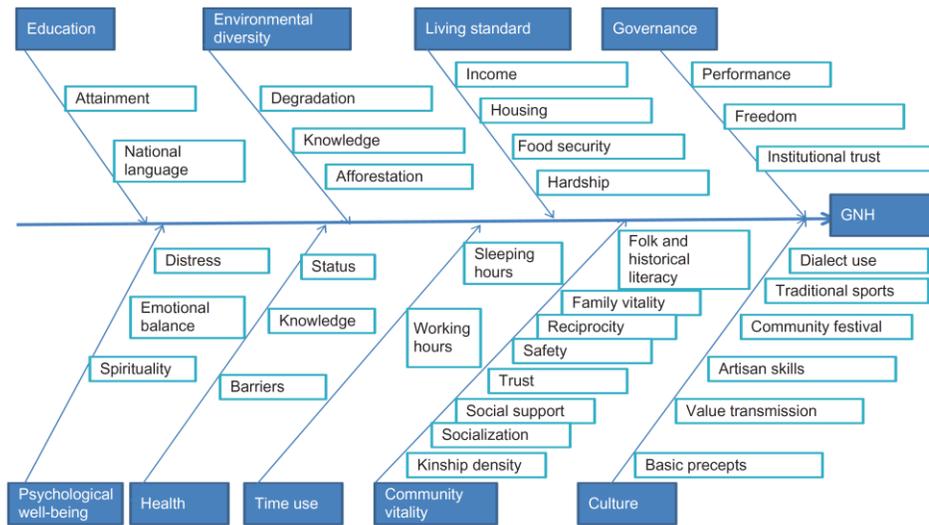
GROSS NATIONAL HAPPINESS

The development philosophy of Bhutan is embedded in the concept of gross national happiness (GNH)⁴, which, as a public policy strategy, seeks to give development a more meaningful purpose than simply material satisfaction. Unlike other cultures, where the pursuit of happiness is generally the pursuit of economic growth, Bhutan’s concept of happiness is subjective well-being. The same term used in the WHO definition of health: “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”⁵ Joining health and happiness makes it possible to combine objective and subjective measures; quantitative measures of health are used along with self-assessment of happiness.

⁴ Refer www.grossnationalhappiness.bt for an overview as well as thematic discussions.

⁵ Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, and June 19–22, 1946; signed on July 22, 1946 by representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100), and entered into force on April 7, 1948.

Figure 3.1: Gross National Happiness and its Domains



Source: T. Tobgay et al. 2011a.

As figure 3.1 illustrates, the GNH concept is grounded in four pillars of development: socioeconomic, environmental, cultural, and good governance. It is based on nine domains of happiness: psychological well-being, environmental diversity, health, education, culture, living standards, time use, community vitality, and good governance. In the culture of Bhutan, “happiness” is multidimensional. Rather than being focused narrowly on the individual (though it can be experienced deeply personally), it is pursued collectively. As applied to policy development, the government has two approaches to achieving goals of national happiness: increase the percentage of people who are happy (after deconstructing the causes of their happiness), or decrease the “insufficient conditions of people who are not-yet-happy” (Ura 2012). Nutrition is not a separate domain but is part of the self-assessment of the health domain. Health and happiness are closely associated in Bhutan; both are seen as having holistic roots.⁶

The GNH index may pave the way to better nutrition in that nutritional well-being is multidimensional and intersectoral—it cannot be achieved without linkages between sectors and specialties. Nutrition is a collective pursuit; it may benefit the individual, but public nutrition in particular must be pursued collectively. Nutrition is both a private and a public good that benefits not only individuals but also communities, and even the nation, due to its impact on productivity.

ETHNIC DIVERSITY

Although Bhutan is a small country, it is remarkable in its ethnic diversity. There are four main ethnic groups: the Ngalops in the west, the Sharchops in the east, the Lhotsampas in the south, and the indigenous and tribal groups scattered throughout the country. The dietary and cultural practices of these groups may be important to understand the regional differences in Bhutan’s nutritional indicators.

⁶ See <http://www.grossnationalhappiness.com/9-domains/health/> accessed on 20 April 2013

ACHIEVEMENT OF GLOBAL GOALS

Bhutan is on track to achieve many of the MDGs. For MDG 1, Bhutan has managed to reduce the prevalence of underweight by more than half, from 38 percent in 1990 to 12.7 percent in 2010, and is on track to halving the population living below the national poverty line by 2015. Insufficient data make it difficult to measure the percentage of the population consuming the minimum level of dietary energy. The country is poised to meet all the education and gender equality targets of girls in primary and secondary schools, although it falters in the ratio of females to males in tertiary institutions. It is also on track to meet goal 4, reducing child mortality, and for goal 5, improving maternal health, although some concerns about this achievement persist (see below.) Bhutan also reports it has achieved its goals for access to better drinking water and improved sanitation.

Bhutan's persistent challenge is less about achieving the global MDG targets than it is about reducing inequity related to both economic status and gender. Gender inequity can be seen in the still persistently high, though improved, maternal mortality ratio (MMR). The MMR in 2010 was 180–200 deaths per 100,000 live births (WorldBank 2012a); a steady reduction from 560 in 1990 and 255 in 2008 (GNHC 2012). In 2008, the range of uncertainty was between 110 and 370 (WHO 2008). The goal of the 11th Five Year Plan is to bring the MMR down to 100 by 2018.

The relationship between nutrition and maternal mortality is now recognized. In most studies the association of severe anemia to the MMR is strong enough to suggest that in some cases it is causal. Estimates of magnitude of effect vary considerably: as high as 20 percent in some studies, or a 2.8 relative risk of death associated with anemia, or odds of death at 5.9 in severely anemic women (Brabin et al. 2001; Rush 2000). Rush points out the importance of measuring anemia in pre-pregnant women, since hemodilution of pregnancy, blood loss, and intercurrent infections can complicate the interpretation of hemoglobin estimates in pregnancy. The evidence is considered solid enough to be used to advocate strongly for interventions that correct anemia not only throughout pregnancy but also in non-pregnant women. In Bhutan, where women have significantly elevated anemia rates and the MMR is still high, advocacy for reducing anemia becomes crucial, along with improving access to emergency obstetric care facilities and skilled birth attendance.

Bhutan has eliminated the once prevalent iodine deficiency disorders by achieving 98.4 percent household coverage of iodized salt. Its immunization program has also significantly reduced the burden of vaccine-preventable childhood diseases; in 2009 it won an award from the Global Alliance for Vaccines and Immunizations (GAVI) for Best Immunization Performance, having reached 96 percent coverage, which has been sustained. It is against this background of success that the stunting and anemia problems loom so large.

Although Bhutan has been successful in minimizing vaccine-preventable communicable diseases and improving its infant and child mortality rates to extend the life expectancy of its population, it now faces the problems that accompany this success: increases in such non-communicable diseases (NCDs) as diabetes, obesity, and other manifestations of metabolic syndrome and rising rates of communicable diseases like HIV and diarrhoea that define the double burden of disease caused by inequity. Understanding how these problems occur calls for deep analysis of basic

causes related to gender, education, employment, and domestic violence. Regional differences between the better-off West and the South and East also expose the impact, real and potential, of ethnic and religious differences.

The enigma of Bhutan is characteristic of other South Asian countries: despite significant improvements in the economy, remarkable achievements in meeting the MDGs, reducing mortality indicators, expanding access to education and so on, the country still struggles with major nutritional problems that could derail its continued progress and reduce the happiness and well-being of its population.

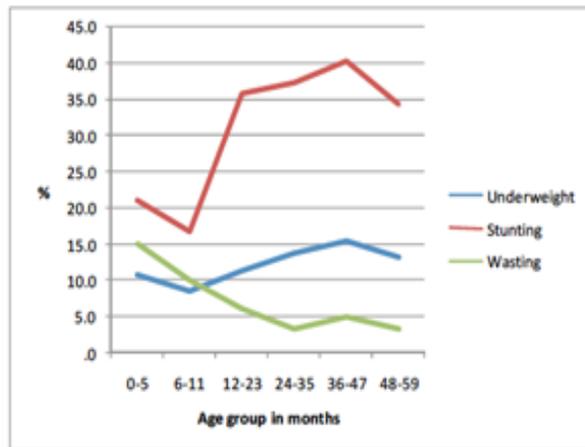
4 DEFINING THE MALNUTRITION PROBLEM IN BHUTAN

INDICATORS OF CONCERN: STUNTING, ANEMIA, OVERWEIGHT, AND OBESITY

4.1.1 Stunting

Although Bhutan has fared better than most of its South Asian neighbors on some nutrition indicators (for example, wasting), the malnutrition agenda is still unfinished. The recent National Nutrition, Infant, and Young Child Feeding Survey (NNS) raised concerns about the trends of two undernutrition indicators: (1) though stunting rates in children under 5 have declined by 24 percent since 1986, they are still a worrying 33.5 percent⁷ (BMIS 2011); and (2) anemia rates—

Figure 4.1: Stunting, Wasting, and Underweight in Children Aged 0–24 Months, Bhutan



Source: FNS 2008.

As predicted by Shrimpton et al. (2001) and Victora et al. 2010, stunting in Bhutan begins at birth and continues to increase until about 24 months of age (see figure 4.1), thus underscoring the importance of intrauterine as well as postnatal causes—and corrections. This is Bhutan’s Window of 1,000 Days.

The prevalence of stunting is higher in the Eastern region, where 56 percent of children are stunted versus 34 percent in the West and 33 percent in the Central region. In terms of moderate and severe stunting, prevalence in the Eastern region is 44.1 percent in boys and 43.9 percent in girls and in the Western region 32.4 percent in boys and 35.4 percent in girls. Among girls, stunting is least prevalent in the Central region (30.5 percent), where the incidence for boys is 35.8 percent.

Severe stunting is more prevalent in the East, afflicting 16.5 percent of boys and 13.4 percent of girls, compared to 13.2 percent for both boys and girls in the Western Region, and only 11 percent of boys and 9 percent of girls in the Central region (table 3)

⁷ A small decline from the measure in the Bhutan National Nutrition Infant and Young Child Feeding Survey 2008 (see figure 7)

Table 4.1: Height for Age, by Region (Percent)

Area	Sex	Normal ≥ -2.000 z- score (95% CI)	< - 2 z-score (95% CI)	Moderate -3.001 to < -2.000 z- score (95% CI)	Severe < - 3.000 z-score (95% CI)
East	Boys	55.9 (49.0,62.8)	44.1 (37.2,60.0)	27.6 (21.4,33.8)	16.5% (11.3,21.7)
	Girls	56.1 (48.8,63.4)	43.9 (36.6,51.2)	30.5 (23.7,37.3)	13.4% (8.4,18.4)
West	Boys	67.6 (61.2,74.0)	32.4 (26.0,38.8)	19.2 (13.9,24.5)	13.2% (8.6,17.8)
	Girls	64.6 (57.7,71.5)	35.4 (28.5,42.3)	22.2 (16.2,28.2)	13.2% (8.3,18.1)
Central	Boys	64.2 (57.7,70.7)	35.8 (29.3,42.3)	24.9 (19.0,30.8)	11.0% (6.7,15.3)
	Girls	69.5 (62.8,76.2)	30.5 (23.8,37.2)	21.5 (15.6,27.4)	9.0% (4.9,13.1)

Source: National Nutrition Survey (FNS 2008).

A causal analysis of stunting district by district is complex and generalizations are elusive—particularly since in 19 out of 20 districts stunting is rated as “poor” (3 districts), “serious” (9), or “critical” (7); only in Bhumtang district is it rated “acceptable.” However, there is a strong correlation between prevalence of stunting in the district and household incidence of poverty ($r = .54$). Though this confirms a relationship between economic status and chronic undernutrition, it is not strong enough to support a recommendation to target only poorer districts with nutritional programs for women and children. With rates of anemia in children as high as 80 percent (FNS 2002) demonstrating a nationwide problem, targeting could mean missing large segments of the population in need of nutrition interventions. The strength of the correlation does, however, indicate a risk factor that can be taken into consideration in identifying vulnerable children.

Of the seven districts rated as having a critical level of stunting, the two worst-off are Zhemgang in the Central region, where stunting prevalence is 50 percent and subsistence poverty is 17, and Punakha in the Western region, where stunting prevalence is also 50 percent but subsistence poverty is a low 1.9 percent (NSB 2007a), (NSB 2007b).

4.1.2 Anemia

Anemia in Bhutan represents a significant public health problem for both men and women throughout the country (table 4.2)

Table 4.2: Anemia Prevalence in Bhutan (Percent)

Zone	Prevalence of Anemia		
	Men	Women	Children
East	29.8	52.6	85.8
West	33.1	56.3	83.2
Central	33.3	57.8	82.5
South	27.3	60.4	74.4
Urban	14.6	57.8	82.5
Total	27.6	54.8%	80.6%

Source: FNS 2002.

The problem of anemia in women and children in Bhutan is not recent. Table 4.3 shows anemia statistics from two different sources, the National Anemia Study of 2002 (FNS 2002) and Tulane University in the United States (Mason et al. 2005). While the studies are not strictly comparable due to differences in methodology, they do demonstrate a worrying picture: the high levels of anemia have hardly changed, and may even have worsened since 1985.

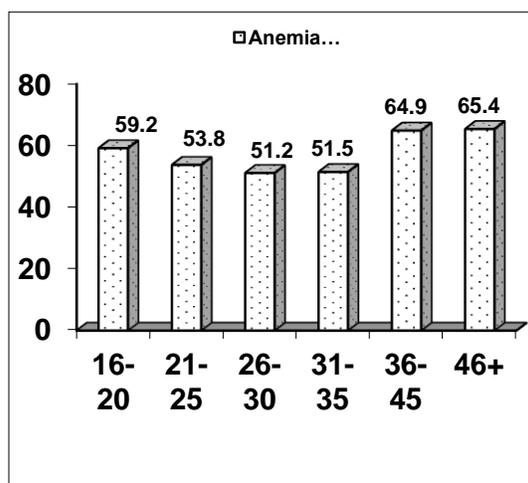
Table 4.3: Measures of Prevalence of Anemia in Bhutan, Percent

Date of Study	Non-pregnant	Pregnant women	Preschool (0-5 years)	School-age (>5 years)	Notes
1985	50**	60**	58 / 50**		
1986		60*	58*	36*	Folate and B ₁₂ also deficient
1990	65.2**		66*		
1994		81*			
1995	54.2**		57.4**		
2000	55.5**		53**		
2001-02				64 (75)*^	^Corrected for altitude
2002	54.8*		80.6*		

Source: **Mason, Rivers, and Helwig 2005.

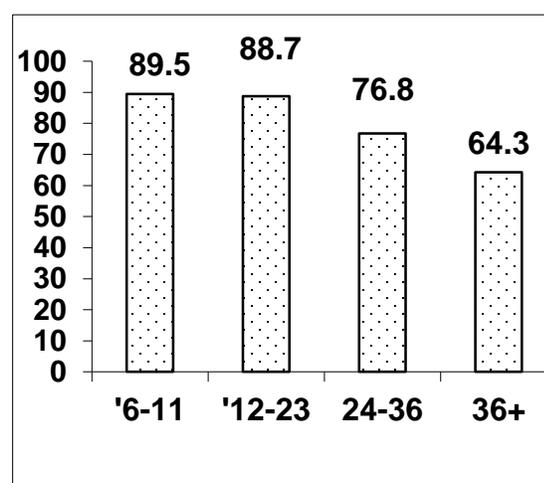
The National Anemia Survey found that anemia in women (figure 4.2) is already high when they enter childbearing age. Children (figure 4.3) are already anemic when they reach the age for complementary feeding and anemia is very high throughout the first two years of life. The two figures demonstrate an unmistakable relation: (1) anemia is a lifecycle problem, and (2) to correct childhood anemia, anemia in women must be corrected before they become pregnant and their iron levels kept up through pregnancy and lactation.

Figure 4.2: Anemia Prevalence in Women (Percent)



Source: FNS 2008

Figure 4.3: Anemia Prevalence in Children (Percent)



Source: FNS 2008

4.1.3 Overweight, Obesity, and the Double Burden of Disease

In 2011 (WHO-SEARO 2011b)) reported that 53.5 percent of Bhutanese women were overweight (BMI $\geq 25\text{kg/m}^2$), 63.5 percent had insufficient physical activity, 11.6 percent had high fasting blood sugar, and 42.3 percent had elevated total cholesterol, $\geq 5.0\text{ mmol/L}$ (Alwan 2011). The link between stunting, low birth weight, and maternal nutrition has already been described. The WHO data demonstrate the relationship between intrauterine nutritional deprivation and later onset of the metabolic syndrome (see figure 1.4).

The danger that childhood obesity will later cause adult morbidities is also well-documented. Largely through the imbalance of high caloric intake and low energy expenditure, childhood obesity is reaching epidemic proportions in some countries (Biro and Wien 2010), and the proportion of Bhutanese children who are overweight has been increasing for two to three decades: prevalence was 3.5 percent in 1986, 4.4 percent in 2008, and 7.6 percent in 2010 (WorldBank 2012a). The National Nutrition Survey found 4.7 percent of preschool children to be overweight (Zangmo et al. 2012)—well above the average for South East Asia (De Onis, Bloessner, and Borhi 2010. Compared to Sri Lanka, the difference is striking: Sri Lanka has seen its overweight rate cut in half, from 1.6 percent in 2007 to 0.8 percent in 2009 (WorldBank 2012a). And the prevalence of overweight in Nepal was just 1.5 percent in 2011 (WorldBank 2012a).

In Bhutan, increasing overweight combined with high rates of stunting is cause for serious concern. The Bhutan Multiple Indicator Survey (BMIS), using body mass index (BMI)-for-age as an alternative indicator to measure prevalence of overweight in children under 5, recorded a national prevalence of 6.9 percent, but in the East some district rates were disturbingly higher: Lhuntse 30.9 percent, Pemagatshel 17.9 percent, and Trashigang 15.6 percent (BMIS 2011). In addition, overweight is much more prevalent in urban environments (10.0 percent) than in rural (6.6 percent; (BMIS 2011)

RELATED INDICATORS OF CONCERN

Table 4.4: Low Birth Weight and Weighing at Birth

Wealth Quintile	Births <2,500 gm (percent)	Weighed at Birth (percent)
Poorest	12.2	43.9
Second	10.5	56.3
Middle	9.5	73.6
Fourth	9.8	88.2
Richest	7.3	97.3
Total	9.9	72.2

Source: BMIS 2011

4.1.4 Low Birth Weight

Given the high prevalence of anemia in women and stunting in children, at 9.9 percent low birth weight in Bhutan is not as prevalent as might be expected. However, review of the data (BMIS 2011) suggests that the figure may be underreported because of unequal access to health services and lack of attendance at birth by a health worker capable of weighing newborns. Table 4.4 shows a higher prevalence of low birth weight in the lower two quintiles, where only about

half of babies are weighed at birth, and those weighed are more likely to be from slightly better-off families than those not weighed. If all children had been measured—especially the poorest, where birth weight would be expected to be low—the total prevalence would surely be higher. Children not measured may have a significantly higher prevalence of low birth weight than those who were. As noted, low birth weight is related to adult onset of obesity.

4.1.5 Alcohol Consumption

Alcohol consumption during pregnancy is known to be associated with low birth weight (Jaddoe et al. 2007); it begins to show its effect with one alcoholic drink per day (Patra et al. 2011). A working paper on NCDs (WHO-SEARO 2011b), concluded that Bhutan had the highest percentage of women in South Asia who consume alcohol (25.5 percent). While some women in the FGDs denied drinking during pregnancy, others confirmed that they all took at least one drink at night to relax and remove discomfort. The fact that one in four Bhutanese women consumes alcohol is cause for concern. Annual per capita consumption of alcohol in Bhutan by both sexes is 0.54 liters; not a large amount compared to countries in Eastern Europe (>16 liters) or even the UK (13.24 liters), or the USA (9.70 liters). However, that it may be excessive for some is suggested by the fact that in Bhutan alcoholic liver disease is the number one killer among hospital deaths (WHO-SEARO 2011b).⁸ A recent study in which pregnant women in the national hospital in Thimphu were asked about alcohol consumption found that 10.9 percent had been drinking in the last week, and 23.7 percent in the last month. They had mostly consumed homemade rice wine and a distilled local drink, *ara* (Udon 2012). Alcohol content of homemade drink is difficult to quantify because its production is unregulated in both method and quality. The wines are believed to be less than 5 percent alcohol; *ara* is considerably stronger (Dorji 2004). Alcohol is also listed as the most common factor triggering domestic violence against women (RENEW 2007).

4.1.6 Exclusive Breastfeeding

The rate of EBF at six months is a low 48.7 percent (BMIS 2011). The recent BMIS measure is an encouraging improvement that reflects government efforts to raise EBF rates, but with fewer than half practicing EBF at 6 months, this issue requires continued policy attention. The importance of the EBF indicator is three-fold:

1. It speaks to the effectiveness of antenatal messages in convincing women about the benefits of breastfeeding. With over 70 percent of mothers reporting at least four ANC visits, expectations are that EBF rates will also go up.
2. Breast milk substitutes of rice powder mixed with butter and salt and infant formula offer entry points for infection and changes in intestinal flora at a time when bowel permeability and hence vulnerability to infections and allergies is high.
3. Causes of any trend toward lower EBF rates need investigation.

4.1.7 Adolescent Pregnancy

The Gross National Happiness Commission noted that 11 percent of 15–19-year-old girls have had a live birth (GNHC 2010), but the average is higher in the BMIS (15.71 percent), given that it records the percentage of women age 20–24 who report having had a live birth *before* 18. The

⁸ Sources of WHO Data were from the following: Country Report on Profile of Major NCDs in SEARO, 2010; MOH, Annual Health Bulletin 2007, RGOB, MOH, Survey of chronic disease risk factors in Urban Thimphu, Bhutan 2007

range—from 3 percent in Gasa to 24.3 percent in Samdrup Jongkhar—identifies areas where adolescent pregnancy is a major problem. There is a very close correlation between household poverty and the proportion of adolescent girls with a live birth before 18 ($r=.64$). These numbers also imply poor access to and acceptability of reproductive health (RH) services—an assumption supported by contraceptive prevalence rates, which in 2000 were 30.7 percent and by 2008 had only increased to 35.4 percent. This is despite the concurrent increase in skilled birth attendance (from 24 to 66.3 percent), and ANC coverage (from 51 to 88 percent).

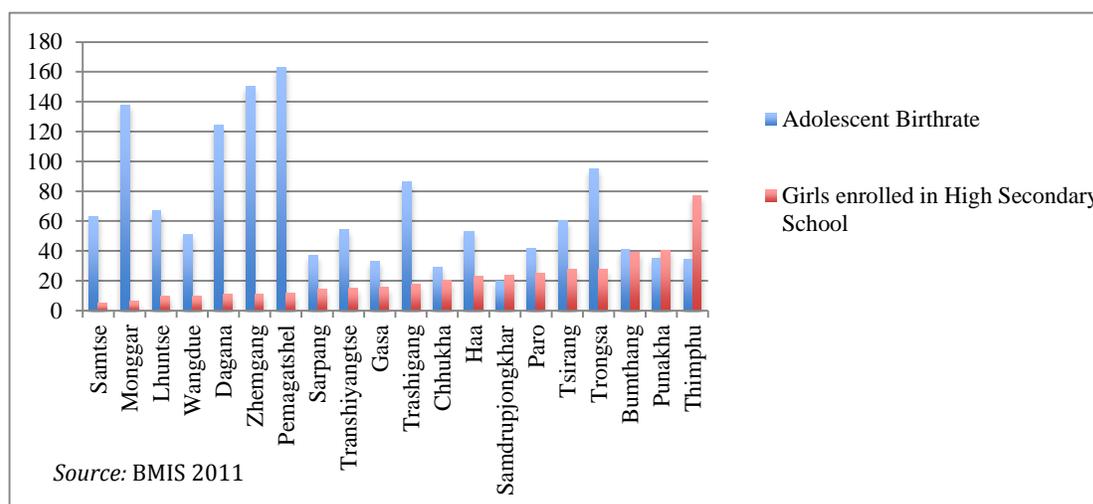
Adolescent pregnancy has been associated with increased incidence of poor pregnancy outcomes, such as pre-term deliveries, low birth weight, stunting, and neonatal mortality. The association seems to be related to the age and biological development of the girl independent of such sociological determinants as poverty and educational levels (Chen et al. 2007). Although stunting is not measured at birth, it is a known consequence of the same poor intrauterine conditions that can lead to low birth weight. Women who are stunted entering pregnancy are more likely to have underweight babies, and the combination of low birth weight and maternal short stature is a predictor for later stunting (Varela - Silva et al. 2009).

Adolescent pregnancies also have a significantly negative effect on the girls themselves. In a study in Bangladesh, pregnant girls aged 12–19 stopped linear growth and had no gain in stature from early pregnancy through the 6–12 month postpartum follow-up period; a never-pregnant matched cohort continued to grow by 0.35 cm / year (Rah et al. 2008).

The proportion of teenagers who become pregnant before 18 is decreasing in Bhutan. However, there is a high correlation between districts where the rate of adolescent pregnancy was high and those where stunting was also prevalent ($r=.54$). The tendency toward early pregnancy in some areas may be culturally embedded and have led to a cycle of poor intrauterine growth and later short stature.

In the developed world, enrollment in school and plans for higher education lower sexual risk-taking and pregnancy rates (Kirby 2002). This is one of the strongest global arguments for ministries of Education extending schooling for girls even beyond the secondary level. The data from Bhutan uphold this argument. While the correlation is not high ($r= -0.43$) it does indicate that districts with higher gross enrollment rates of girls in higher secondary school (NSB 2007b) tend to have lower adolescent birth rates (BMIS 2011).

Figure 4.4: Adolescent Birth Rate and Enrollment of Girls in Secondary School



MICRONUTRIENT STATUS

4.1.8 Vitamin A

The Bhutan Ministry of Health Annual Report of 2012 states that “micronutrient deficiency of Vitamin A is no longer a public health Problem” (MoH 2012b). This is supported by data from the 2000 National Vitamin A Deficiency (VAD) Study, which found a subclinical prevalence rate of 2.6 percent. However, reports on coverage with vitamin A capsules have reached different conclusions: the National Nutrition Survey (2008) reported that 87.9 of children under 5 had been given a Vitamin A supplement in the six months before the survey, while UNICEF’s State of the World’s Children (2009) reported coverage of just 48 percent in 2007. This would represent a significant reduction from the 93 percent coverage reported in 2000. A probable explanation is that distribution has become more difficult since there are no more National Immunization Days for polio (there have been no polio cases since 1986). Other routes of administering the capsule, through the Expanded Programme on Immunization (EPI) program for children under a year old, the Growth Monitoring and Promotion program for 1–5-year-olds, and high-dose tablets for all primary school children, are not capable of attaining the same high levels (Black and Stalker 2006).

Supplementation remains the major source of consistent Vitamin A intake for preschool and school-age children, although international studies of the value of home gardens in improving vitamin A intake of women and children are very positive. These studies were launched to test alternatives to supplementation and fortification strategies (Girard et al. 2012) This is an important support for the practice in Bhutan, where in the National Nutrition Survey, 72 percent of households were found to have home gardens.

4.1.9 Vitamin B Complex

Almost annually since 1998 there have been reports of Vitamin B1 and B12 deficiencies. An investigation of a 2012 outbreak of neuropathy in 19 students in Lhuentse District in the North East revealed a number with symptoms of nutritional neuropathy. Of eight students from one higher secondary school who were hospitalized, seven responded to doses of Vitamin B complex. The investigators concluded that the outbreak was due to a vitamin-deficient diet that was very low in animal protein: they had rice, potato, and dhal for lunch and dinner, and fried rice and milk tea for breakfast. Meat and meat products were given once a month. If available, eggs were on the menu once a week, with oral reports that dried fish was given twice a week. The response to vitamin B was seen as confirmation of that conclusion (Phuntsho 2012). Supplementation with B vitamins was subsequently extended to the armed forces, schools, and other institutions where similar dietary deficiencies were seen as likely.

4.1.10 Iodine

The success of the iodine fortification program, with 98.4 percent of household salt now iodized (FNS 2008)), demonstrates the potential for food fortification programs in Bhutan. Acceptance of fortified foods, as with iodized salt, is increased when the correct commodity to be fortified is chosen, and particularly if the addition does not change the color, taste, or texture of the food fortified.

ENVIRONMENTAL PATHOGENS THAT AFFECT NUTRITION

4.1.11 Worm Infestation

Because many Bhutanese children grow up in unsanitary environments where open defecation is still practiced (Collett 2010), parasite infestation would be expected. However, few studies have measured the parasite load. The National Anemia Study asked respondents whether they had passed worms in their stool, and 8.9 percent of children, 8.7 percent of women, and 6.7 of men said they had. One recent study from Western Bhutan (Allen, Sithey et al., 2004) found a cumulative prevalence of 16.5 percent of soil-transmitted helminthes (STH) in school children aged 6–17 (mean age=11.5). The predominant infections were of *Ascaris Lumbricoides* (12.8 percent) and *Taenia Solium* (6.7 percent).

One disturbing finding was that prevalence of an STH infection was 4.8 percent in schools where deworming tablets had been given in the three months before the study. In untreated schools prevalence was 24 percent (19.8 percent *Ascaris*, 74 percent whipworms (*Trichuris*), and 11 percent tapeworms (*Taenia*). The authors pointed out that in all schools in the region, treated and untreated; there had been annual deworming for 15 years. Their recommendation was to continue with the deworming program but intensify personal and environmental hygiene education and support, such as campaigns to halt open defecation and promote hand-washing with soap.

4.1.12 *Helicobacter pylori*

Helicobacter pylori is a bacterium found in the stomach that is causally linked to duodenal ulcers and possibly stomach cancer; it is associated with iron deficiency anemia. Eradication of *H. pylori* has led to improvements in iron-deficiency anemia in patients previously resistant to supplemental iron therapy (Stenström et al. 2008).

Globally *H. pylori* is widespread in both adults and children. Bacteria are spread in the environment because of poor hygiene and ingested orally. Those infected may be asymptomatic, and anemia can be found even in people without gastritis. In 2010 a population-based endoscopic survey examined causes of dyspepsia and the prevalence of *H. pylori* in 378 volunteers with and without dyspeptic symptoms in Thimphu, Punakha, and Wangdue (Mahachai et al. 2012). The overall infection rate was found to average 71.9 percent, ranging from 82.1 percent in Punakha to 65.5 percent in Thimphu. However, the study did not measure anemia levels. Still, the prevalence of *H. pylori* in this study coupled with the high rates of anemia in women and children suggests a relationship that warrants further examination. It would be reasonable, given the data, to consider treatment for *H. pylori* of women with persistent anemia that is unresponsive to supplementary iron.

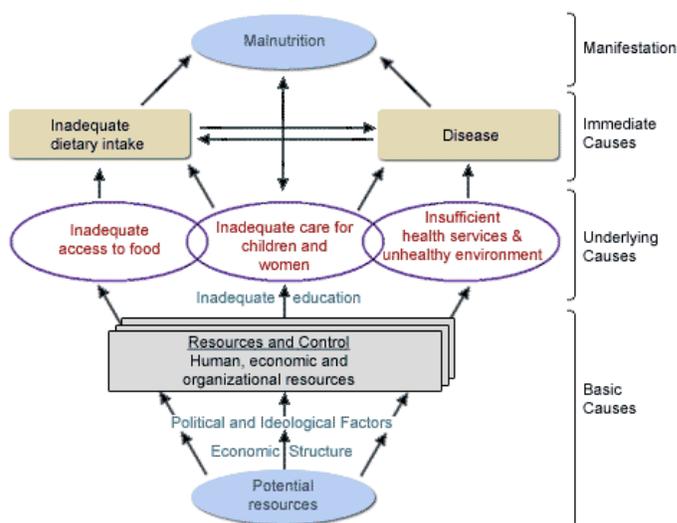
4.1.13 Malaria

According to the 2012 MoH Annual Report, the number of malaria cases has declined significantly, from 22,126 in 1990 to 194 in 2011. This represents a change from 87 per 10,000 people in 2000 to only 5 in 2011. Today malaria is an insignificant contributor to maternal and child anemia. The success of the anti-malaria program has been attributed to education, use of insecticide-treated bed nets, indoor residual spraying in highly endemic areas, early diagnosis, and effective treatment.

5 DETERMINANTS OF UNDERNUTRITION IN BHUTAN

THE NUTRITION CONCEPTUAL FRAMEWORK APPLIED TO BHUTAN

Figure 5.1: Nutrition Conceptual Framework



Using the UNICEF conceptual framework for malnutrition (figure 5.1; (Jonsson 1995; UNICEF 1990), determinants of stunting and anemia can be divided into three types of causes: immediate, underlying, and basic. Both food insecurity (inadequate access to food) and nutrition insecurity (inadequate access to food, care, services, and clean environment) are influenced by the basic causes, primarily education, control of resources, political and ideological factors, and economic structures.

5.1.1 Immediate Causes

Though evidence of inadequate dietary intake is difficult to measure, a reasonable estimate can be based on the levels of food (subsistence) poverty recorded in the Bhutan Living Standards Survey (NSB 2007b) and the Poverty Analysis Report (NSB 2007a). The basic requirement is 2,124 Kcal per person per day. The monthly cost of the food basket that would meet this requirement is estimated at Nu. 688.96 (US\$12.50)—this is considered the food poverty line. Households whose occupants consume less than this are considered “subsistence poor.” In 2007, food poverty for Bhutan was 6 percent, although higher at 8 percent in rural areas, and with high inter-district variability (for example, food poverty in Samtse was 17 percent). Food poverty rates offer an approximation of the percentage of families with inadequate daily dietary intake.

Diseases that contribute to malnutrition can also be immediate causes. Diarrheal diseases affect 25 percent of under-5 children in BMIS 2011 and anemia-causing *H. pylori* infections affect > 70 percent of the population (Mahachai et al. 2012). Parasitic infections were also found in 16 percent of the population in a Western Region study 10 years ago (H. Allen et al. 2004). Recent publications have drawn attention to the association between open defecation and stunting: The prevalence of open defecation explained differences in stunting rates in different populations (Spears 2013) and was closely linked with changes in stunting rates within populations (Cov 2013).

Understanding of immediate causes can guide government decisions on short-term interventions. Taking steps that would yield immediate results could also address underlying causes (see below), such as inadequate dietary intake through improved use of accessible foods for women

and older children (for example, eggs, chicken, a balance of grains and legumes from home gardens), and improved infant feeding practices (for example, a mass campaign to promote breastfeeding and introduce appropriate weaning foods). By improving dietary intake, such measures could lead to rapid changes in underweight and wasting, and eventually (assuming improved maternal nutrition) to less stunting. The effect would be enhanced by reducing nutrient losses in women and children through a combination of sanitation, personal and environmental hygiene, and access to safe water, which would reduce the intestinal bacterial loads that lead to malabsorption and diarrhea (Humphrey 2009) (Luby et al. 2005). Finally, because of its prevalence treatment of *H. pylori* in women and children could quickly reduce maternal and child anemia. The government can use these types of responses to win popular support for medium- and long-term interventions, which, even launched simultaneously, will not show results at once.

5.1.2 Underlying Causes

Inadequate dietary intake is the result of inadequate access to food. This close link between an underlying cause (inadequate access to food) and an immediate cause (insufficient food intake) must be exploited. While the caloric cut-off for subsistence poverty rates (2,124 kcal) can be used as a proxy for inadequate dietary intake (people do not eat enough food because they cannot afford it), the cost of those calories (US\$12.50 per month) functions as a proxy for accessibility. There are indications that food poverty rates are increasing; and though there are no estimates available of the number of food-insecure people in Bhutan (Maetz 2012), 35 percent of rural households surveyed in 2007 reported some food shortage during the year, half of them for more than four months (Maetz 2012). Food shortages and chronic food insecurity are greater in the East and South regions (BMIS 2011), where poverty is also higher.

In Bhutan, appropriate infant and young child feeding can also help reduce stunting and other forms of undernutrition. At the underlying level of causality, infant and young child feeding practices are far from optimal. Exclusive breastfeeding rates at six months are 48.7 percent. About two-thirds of families practice appropriate introduction of solid, semi-solid, or soft foods at appropriate meal frequency and also practice age-appropriate breastfeeding (BMIS 2011). Qualitative data showed that though early colostrum and breastfeeding were universal, EBF was hindered by the practice of feeding water and butter early and by the work load of women in the fields. The women in FGDs also seemed to lack knowledge about appropriate feeding practices and which foods high in nutrients were appropriate for children. Women consistently mentioned their workload as a barrier to good nutrition and care of their children.

Table 7 shows other underlying causes. Of importance are the high numbers of adolescent pregnancies and the low rates of contraceptive use (GNHC 2010). And high MMR and levels of maternal anemia persist even though 77 percent of women have at least four ANC visits.

A correlation of interest with regard to anemia in women is its association with domestic violence (an underlying cause that relates to inadequate care of women and children). A study in India found that multiple incidents of domestic violence were associated with anemia and underweight in women and possibly in children (Ackerson and Subramanian 2008). Acceptance of violence (a husband is thought justified in beating his wife under certain circumstances) is high in Bhutan, where about 70 percent of women accept the violence. At 90.4 percent acceptance was highest in

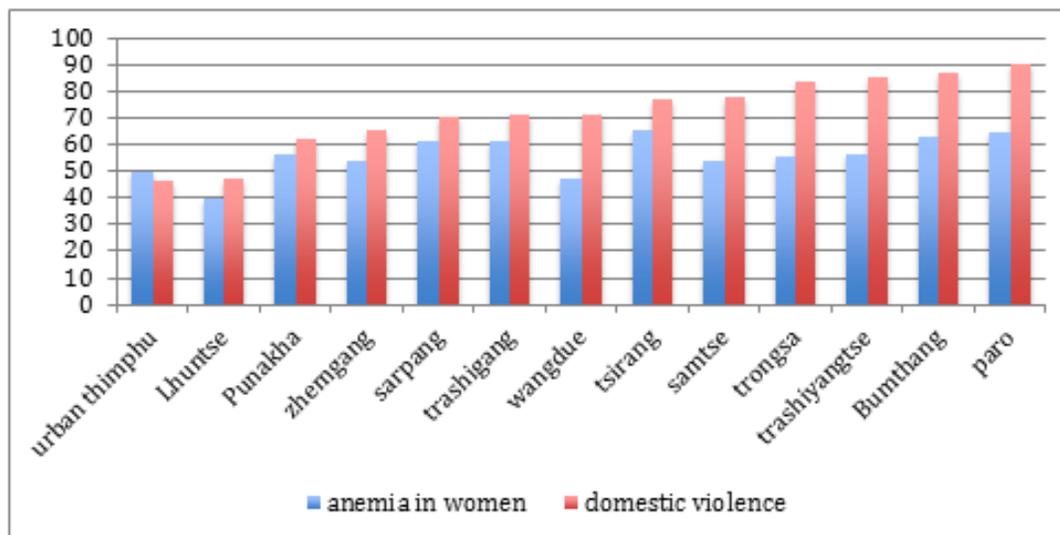
Paro (BMIS 2011). When the BMIS results were compared with district levels of anemia, the correlation was significantly high ($r=0.74$) (figure 5.2).

Table 5.1: Other Underlying Causes of Malnutrition in Bhutan

Causal Factor	Condition	Evidence
Inadequate care for children and women	Antenatal care Skilled birth attendant (SBA) present MMR Adolescent pregnancy Contraceptive use EBF	97.3% one visit; 77.3% four visits 64.5% with SBA (BMIS 2011) 200/100 k/ lb (CI 110-370) 12.3% of births to 15–19-year-olds [GNHC 2010] 35.4% [GNHC 2010] EBF rates 10.4% at 6 mos (36.9% @ 4 mos) [NNS 2008]
Insufficient health services and unhealthy environment	Immunization rates MMR Parasitic and diarrheal disease Coverage of improved water and toilets Use of toilets Personal hygiene	Sustained at >90% [MOH 2012] (see above) (see above) Access to safe water – 88% Access to toilets – 95% Use rate – 58% [MOH 2012] Availability of soap 99%; place for handwashing 80% [BMIS 2010]

Source: Authors' compilation based on various sources as indicated above

Figure 5.2: Women's Anemia and Acceptance of Domestic Violence in Selected Districts (Percent)



Source: BMIS 2011

Dietary habits may also contribute to poor iron absorption. Decreased absorption has been reported due to drinking tea, in one study by as much as 50–70 percent, although it is generally only non-heme iron and the greatest effect is when tea and iron are consumed together and

calcium consumption is high (Thankachan et al. 2008; Yang and Landau 2000; Zijp et al. 2000). The same studies also found that simultaneous consumption of foods rich in Vitamin C enhanced iron absorption. Tea consumption is high among Bhutanese women, as is a diet rich in non-heme iron. Although anecdotal reports from Bhutanese women suggest that tea is taken separate from meals, the tea consumed is heavy with milk, which may introduce another barrier to iron absorption. These may be points to be reinforced in communication programs, along with promotion of more animal sources of iron and simultaneous consumption of foods high in ascorbic acid.

EBF rates at 6 months, although improving, are still low (BMIS 2011), despite evidence of accessibility to health workers as demonstrated by a continuing immunization rate of >90 percent. ANC visits are lost opportunities for preparing mothers for early and exclusive breastfeeding, and convincing them of the need for skilled attendants at birth. The frequent encounters necessary to keep immunization rates high indicate that health workers have access to families and could be using those encounters more effectively for nutrition education and counseling.

These lost opportunities are also reflected in the health and environmental service statistics. Toilets are available in 95 percent of households but the reported use rate is only 58 percent. Bhutan thoroughly documents provision of essential health services, but the services are not being used to their fullest.

Bhutan has the highest coverage of toilets in the region (95 percent of all households) and of households reporting access to an improved water source (88 percent). However, at the South Asia Hygiene Practitioners' Workshop Collett (2010) noted that correct use of these facilities and associated hand-washing is not nearly so high. Front-line health workers still find it difficult to convince people to use toilets because of their smell or because of a persistent preference for open defecation. Sixty percent of toilets were poorly maintained, and 12.8 percent of households were observed to have human feces around the house. The BMIS notes that most people are continuing to use pit latrines without slabs (37.6 percent), which, according to the Joint Monitoring Programme for Water and Sanitation is not considered improved sanitation. In addition, though some 93.6 percent of respondents were able to explain when it was important to wash hands, only 21 percent of households had a place to do so inside or near the toilet area (Collett 2010).

Young children living in unsanitary environments without proper personal hygiene can absorb significant fecal bacteria that may or may not cause diarrhea but will likely cause tropical enteropathy. This is an inflammatory bowel disease where gut walls become more permeable and malabsorption of nutrients and a complex immune reaction in the body can lead to chronic malnutrition. This can be corrected by using antibiotics to remove the offending bacteria. As has also been seen in animal husbandry, constant microbial challenges to growing organisms lead to chronic growth-suppressing immune responses as nutrients that should be used for growth are channeled into preventing or fighting symptomatic diseases (Humphrey 2009; Ramalingaswami et al. 1997). With recognition of the impact of tropical enteropathy, sanitation and hygiene take on added importance.

Undernutrition may be the result of either diarrheal or non-diarrheal intestinal diseases. In the *Lancet Nutrition Series* (LNS) Bhutta and colleagues (2008) argued that even if coverage of hygiene and sanitation interventions was near-total, although the incidence of diarrhea would be reduced by 30 percent, the prevalence of stunting would go down only 2.4 percent. If, however, diarrhea is not the only manifestation of intestinal disease, the impact of an unsanitary environment may be much greater. Also in the LNS Humphrey (2009) noted that an analysis of Demographic Health Survey (DHS) data from eight countries showed an association between better sanitation and improvements in stunting that decreased stunting prevalence from 4 to 37 percent in rural children and 20 to 46 percent in urban children—an effect likely attributable to tropical enteropathy.

Though people may know how to prevent diarrhea from a contaminated water source by boiling water and storing it safely, or by washing hands with soap and water, for various reasons they may not do either. As a result, the number of reported cases of diarrhea in under-5s, as a marker of unclean environment, dropped only 12 percent between 2000 and 2010 (Collett 2010); 25.1 percent of children under 5 had diarrhea in the two weeks before the BMIS survey.

5.1.3 Basic Causes

To understand the mixed performance signals, what is needed is deeper multisectoral analysis into basic causes (as characterized in the UNICEF Framework shown in figure 5.1).

Human resource capacity: At the interface between basic and underlying causes, and a factor in all causes, is the availability of staff trained in public nutrition. At present, the MOH has only one nutrition specialist at headquarters and six facility-based dieticians in the field. There are not enough senior-level jobs in this small country to warrant a master's program in public health; graduates would have to leave the country to find jobs. There are, however, primary health care workers who could be trained in public nutrition but whose present job descriptions are outdated—the job descriptions (JDs) for staff in basic health units (BHUs) in Bhutan were written in 1998, long before significant changes in understanding of public nutrition. In a study by the South East Asian Regional Office (SEARO) of WHO, responsibility for food and nutrition appears in the job description of only one of three types of basic health worker (BHWs); nutrition is mentioned only once in the JD of health assistants (HAs) and not at all for auxiliary nurse midwives (ANM; (Chot 2006). The HA is responsible for prevention and control of endemic diseases, for safe water and sanitation, and for maternal and child health (MCH) and family planning (FP). MCH / FP would offer a logical entry point into public nutrition but this is not presently in the job description.

Human resources for public nutrition exist outside the health sector in the persons of agriculture extension workers and school teachers. They not only have access to the community of parents and children, they also have credibility and potential knowledge (though not yet connected directly to the topic) about subjects that impact nutrition.

Demographic and agricultural factors: Rapid urbanization (37 percent so far, with an additional 3.7 percent change each year; (WorldBank 2012b) affects Bhutan's agricultural productivity as young people leave the countryside to find education or jobs in the cities (Maetz 2012). Only 2.93 percent of land in Bhutan is being farmed (MoAF 2011). More men than women move to the cities, leading

to a “feminization” of agriculture (MoAF communication). This has implications for women’s health as heavier physical labor without nutritional compensation and rest can further undermine women’s nutritional status.

Educational factors: Bhutan is justifiably proud of the fact that there is gender parity through secondary school, though in tertiary education the ratio of girls to boys is only 0.53 (AES 2009). The adult literacy rate for females is 38.7 percent compared to 68.5 percent for males. While the rate is better in younger females, suggesting that educational levels are improving, the recent BMIS showed that only 56.5 percent of females aged 15–24 are literate (BMIS 2011). The FGDs suggest that both boys and girls give education high importance. Community groups noted that in most cases, if the parents can afford it, both boys and girls can opt for higher education. If cost is the major factor, educational inequity becomes another marker of economic inequity. However, where educational levels are high for boys and girls, schools are well-situated to offer nutrition education to both.

Status of women: Gender issues in Bhutan are not as visible or as easily understood as in some other South Asian countries. Society does not openly discriminate against women, yet due to such causes as their lack of higher education, women occupy only 8.5 percent of seats in the National Assembly and none in district governments. Only 14 percent of lawyers are women, and in business and work in the formal sector men earn twice as much as women (NCWC 2008). Women have a decision-making role in the home, but they are less prominent in the public sphere—in government, business, professional activities, and religion—where their views and voices could change policy.

An emerging concern is the level of reported domestic and intimate partner violence against women—frequently involving alcohol, money, or extramarital affairs. A GNHC report cites an increase in reported cases of violence against women from 287 in 2007 to 437 in 2009 (GNHC 2010). These are not high numbers, but the qualitative data suggest that underreporting could be common. Recent studies showing an association between domestic violence and nutritional impairment, including stunting and anemia (see figure 12), possibly mediated through physiological stress hormones during pregnancy and by other psychosocial factors before and after delivery (Ackerson and Subramanian 2008; Yount et al. 2011).

Transport and infrastructure: Education, access to health services, and geographic isolation are related. The government has recognized this: its goal has been that 85 percent of the rural population will live within a half day of the nearest road by 2013; in 2007, 77 percent were within that distance (WorldBank 2012b). Physical isolation is also being overcome by improvements in communication technology: 107 geogs were reported to have mobile access in 2010, a number that according to anecdotal information is now much higher. The access to Internet ratio was 1.5 per 100 inhabitants, having doubled since 2003; the target is 10 per 100 (GNHC 2011). These advances have clear implications for distance learning, communication of data, and provision of emergency care.

Equitable access to clean environments: Of importance in considering a multisectoral approach to malnutrition is the association of education and wealth quintile with improved sanitation and

water. In the richest quintile 94 percent used improved sanitation, versus 31.6 percent of the poorest; 8.2 percent of the poorest used *unimproved* drinking water versus 0.2 percent of the wealthiest. Where the head of household had no education, 42 percent of households used an unimproved sanitation facility versus 5.8 % of those with secondary or higher education. (BMIS 2011)

6 COMMUNITY CONTEXT: PERCEPTIONS

To further assess determinants of malnutrition in Bhutan, community perceptions were researched through 24 focus group discussions (FGDs) in six districts (*dzongkhags*) representing differing zones of the country. Participating in the groups were young women aged 15–24, older men and women, pregnant women, and women with children under age 2. The findings discussed here reveal perceptions that have significant impact on undernutrition.

6.1.1 Perceptions of Undernutrition

Groups for mothers, adolescent girls, and other women examined the community's ability to recognize undernutrition. Their perceptions of undernutrition in children were primarily related to visible physical signs of weight loss and comparison of a child with others in the community. Not surprisingly, the symptoms most commonly associated with child undernutrition were underweight, having a low level of activity and energy, being irritable and crying incessantly, and loss of appetite. Notably, stunting is not recognized as undernutrition; with nearly half of all children stunted, difference with peers does not stand out. Height was never mentioned as being used to assess nutritional status in any group.

The other powerful finding was that some groups were not aware of what constitutes good nutrition and nutritious food. Many participants did not understand the concept of eating a variety of foods so as to provide the balance of nutrients needed for normal growth and development. There was a strong preference for a rice-based diet and a move to imported white rice and away from traditional grains, such as buckwheat, millet, and maize. Few today eat the traditional red rice, which is now a delicacy in the Western world.

6.1.2 Food and Food Security

The FGDs noted that even when there were food shortages, people in general did not eat less; what they did was to change the quality of what they ate to less expensive, less nutritious foods. Changing food patterns were motivated by urbanization and exposure to the media. Among the more important findings was that food was often wasted due to a lack of organized and safe storage facilities in homes. Food preservation was basic, mainly drying vegetables and meat; no other forms of storage and preservation were mentioned. Meat consumption depended on religious beliefs, sanctions against killing animals, and the affordability and accessibility of meat in rural areas.

6.1.3 Gender

Both men and women took care of children except in the least developed areas in the Eastern region, where the division of labor was more traditional. A concern for women's nutrition was common though not universal and occurred almost entirely when they were pregnant; there was little mention of special treatment at other times.

Although the distinction was less clear in the household itself, in general, social stereotypes favored boys and men. Gender differences were seen particularly in roles outside the household, where men had more freedom, more access to jobs, and higher incomes. In many cases, men were paid as much as twice the wage as women for similar work. However, domestic violence and divorce were not uncommon; reportedly, domestic violence was usually associated with alcohol consumption.

Gender-based differences in food practices did not emerge from the FGDs except those in Tsirang. However, the relative lack of empowerment of younger girls, particularly in matters of sexuality and reproductive choice (which may explain the high frequency of teenage pregnancies mentioned by a number of groups), was evident in most groups. This lack of decision-making power finds expression in their poor utilization of available female forms of contraception (e.g., contraceptive pills, female condoms). Such differences are not seen between adult women and men.

There were few if any differences in education based on gender. Participants perceived that the prioritization and preference for continuing education and for higher education were based not so much on gender as on whether the household could afford higher education, the aptitude and academic achievements of the children, and an evaluation of which child would need education more than the others for future work. This was true of all groups except those in Tsirang, which has a large ethnic Hindu population; in Tsirang there is the patrilineal inheritance characteristic of most other South Asian countries and an accompanying preference for male children to stay in school longer. Dowry, however, is not practiced anywhere in Bhutan. There are other districts where there is a patrilineal inheritance, but they do not exhibit the same male preference as Tsirang.

6.1.4 Antenatal Care

ANC was usually accessed only after the first trimester or just before delivery. Acting on traditional beliefs, women prefer to keep pregnancy secret for the first three months. Many are also often unaware that they are pregnant until late in the first trimester. Institutional deliveries were preferred as being safer, but clinics and hospitals were usually inaccessible due to lack of roads and affordable transportation. At health facilities, however, personnel were perceived as not always being sensitive to the needs of the poor and illiterate.

6.1.5 Feeding of Infants and Young Children

Early breastfeeding and feeding colostrum seemed to be universal, although exclusive breastfeeding (EBF) was hindered by the cultural tradition of introducing water and butter early. A major deterrent to EBF is the workload of the mothers, who often need to go into the fields within six months of birth. One member of a group of mixed ages and genders in Haa commented: “Those mothers who stay in villages usually do not get enough time to spend with their children as they have to go out for work daily and the child doesn’t get proper love and care.” The practice of taking infants to the fields was not common. Though many mothers stayed at home for the first three to four months after the child was born (older women and grandmothers took over much of the caregiving after that), not having access to a care facility or crèche close to the workplaces or fields was a major barrier to EBF for the full six months.

The FGDs revealed a common perception that packaged milk substitutes were appropriate and preferred foods for children aged up to 2. These were seen as readily available in local markets and some women believed they made the children fatter. Women also liked the fact that they took little time to prepare. The lack of understanding of both the right age to start complementary feeding and the right foods to give reveals itself in the growing tendency to use packaged infant milk substitutes.

6.1.6 Adolescent Nutrition

While there appear to be no significant differences in food consumption between adult women and men, consumption of processed, packaged foods—which group participants themselves termed “junk foods”—is perceived to be higher among adolescent girls and young women than males of similar age. Adult women often expressed frustration that their adolescent daughters were afraid of becoming fat and therefore did not always eat nutritious foods (i.e., meat and ‘fatty foods’, according to a group in Haa) but consumed smaller amounts of such junk foods as instant noodles, snacks, and potato chips. Boys, on the other hand, consume less junk food and eat more rice and meat, especially at home. For girls there are also traditional practices during menstruation, such as the avoidance of milk tea or other excess liquids and sometimes iron tablets, all of which are perceived as increasing menstrual flow. In general, girls complain of the taste of the iron tablets as well, saying they spit them out even after the teacher has put the tablet in their mouths.

There is also a growing trend toward vegetarianism expressed in the focus groups, particularly among young women and adolescent girls. This may reflect increasing religiosity in these groups, but this was not clear from the discussions.

6.1.7 Maternal Nutrition

Women are often given more food, and more nutritious food, during pregnancy and even after birth, but they do not have special diets before pregnancy. The only determining factors are reportedly the woman’s appetite and her food preferences. There are a few food taboos (e.g., papaya should be avoided as it can lead to miscarriage). Families try to improve the quality of what a pregnant woman eats, since she tends to eat less due to nausea and loss of appetite.

Although many mothers have been made aware of the dangers of drinking alcohol when pregnant and during lactation, the practice is still common. Some believe that alcohol gives both mother and child energy; older women will recommend it to ease pain and help the mother relax through the delivery. Transmitted through breast milk, it is also thought to help the baby to sleep. Though there is a growing sense among younger mothers that the risks may outweigh the gains, in most communities the opinions of elder women are more persuasive.

6.1.8 Environmental and Personal Hygiene

The FGDs revealed that appropriate toilet facilities, hygiene, and sanitation were lacking in most communities sampled. The Bhutan Multiple Indicator Survey showed that nationwide only 50 percent of the population had improved sanitation facilities (BMIS 2011). Most participants had regular access to pit latrines shared by several households, but water was not available in or near the toilets for flushing or hand-washing. Only well-off households had flush toilets. Many noted that open defecation was common, especially when they had to work in the fields all day and had no access to toilets. For both pit latrines and open defecation, hand-washing was rare, primarily because there was no water nearby. While some did report carrying water for hand-washing, use of soap was not common. However, adolescent girls and young women were comparatively more aware of the need for cleanliness and appropriate sanitation and hand-washing. Most of the schools had flush toilets or water sources accessible to pit latrines.

7 CAPACITY TO ADDRESS UNDERNUTRITION

POLITICAL COMMITMENT TO HEALTH, NUTRITION, AND AGRICULTURE

Bhutan's political commitment to the health program is evidenced by the significant improvement in indicators related to achieving the MDGs. However, the National Health Accounts showed a slight decrease in total spending as a percent of GDP, from 4.4 percent in 2005 to 4.1 percent in 2011; there was also a decrease in general government spending on health as a percentage of total spending, from 9.0 percent in 2005 to 7.9 percent in 2011.⁹ Of the health budget, 83 percent went to curative care, and only 14 percent to on preventing illness and promoting health (Collett 2010).

Investment in human resources is the weakest link in the health system. There is a chronic shortage of doctors and nurses, though the government is taking steps to remedy the situation both temporarily and long-term by bringing in doctors from neighboring countries and deploying doctors for monthly rosters at hospitals lacking specialists; for the long term, it is launching a major initiative to open a university of medical sciences to reduce the demand on outside sources. The human resource situation for nutrition is even worse: the MOH has only one nutritionist heading its program and six dieticians deployed in the districts.

The renewable natural resources (RNR) sector has experienced significant declines. Between Bhutan's 8th and 10th Five-Year Plans, the RNR share of the budget decreased from 12 to 5.5 percent. This shift reflects a change in economic development priorities as the government shifts from agriculture to hydroelectric power as the major export. The shift has been accompanied by a worsening agricultural trade deficit in the RNR sector, particularly with India; in 2010 agriculture was responsible for 45 percent of the national trade deficit (Maetz 2012). This has undermined food self-sufficiency. Accelerated imports of Indian vegetables and cereals at lower prices have pushed domestic products such as maize and buckwheat out of the home. Rising importation of processed foods has other nutritional implications, particularly in terms of promoting overweight and obesity.

Migration issues are of importance to the government, among them immigration from neighboring countries, internal rural to urban migration, and departure of skilled professionals to other countries. Recognizing how these factors affect the availability of food and of workers for agriculture, the Ministry of Agriculture and Forests in April 2013 initiated a survey on the impacts of migration on food production and livelihoods that is slated to cover both urban and rural areas.¹⁰

⁹See <http://apps.who.int/nha/database/StandardReportList.aspx> for national health accounts, accessed on 27 April 2013.

¹⁰ See <http://www.moaf.gov.bt/moaf/?p=14565> accessed on 27 April 2013

8 CURRENT PROGRAMS: GAPS AND OPPORTUNITIES

A number of different ministries and departments currently have programs that do or could have implications for nutrition. In some, an opportunity to enhance awareness of good nutrition and nutrition-related behaviors is being lost. With a little programmatic adjustment and some capacity-building training for staff, these programs might have much more impact on Bhutan's nutrition problems.

NUTRITION-RELATED PROGRAMS IN HEALTH

The Ministry of Health has an official Nutrition Programme. The National Health Policy makes explicit that the government “shall strive to reduce malnutrition of all types including reduction of micronutrient deficiency diseases through a multi-sectoral approach,” and that “healthy growth and development shall be promoted through advocating breast-feeding, appropriate nutrition, and Integrated Management of Neonatal and Childhood Diseases” (MOH 2012a) . This policy is reflected in the initiative to reduce stunting and anemia in women and children that motivated the current assessment.

Until the recent change in emphasis, the main focus of the program has been reducing protein energy malnutrition and micronutrient deficiencies in children under 5 and pregnant and lactating mothers, through dietary diversification, child feeding and care practices, growth monitoring, and nutrition rehabilitation. Four programs attacked micronutrient deficiency: (1) iron deficiency anemia control, (2) iodine deficiency disorder control, (3) vitamin A deficiency control, and (4) food fortification and vitamin supplementation.

Among the 10 strategies to address protein energy malnutrition and micronutrient deficits were promotion of breastfeeding and child care practices through legislation and a community-based nutrition program; appointment of a Nutrition Core Group; tighter nutrition surveillance; formulation of a nutrition information and communication strategy; and internal monitoring to reinforce program activities and recommend plan of actions.¹¹

A National Breastfeeding Policy launched in 2002 recommended EBF for four months¹²; although a national breastfeeding committee (the Child Health Advisory Group) was established, it has been unable to meet regularly. As of 2011, only 48.7 percent of mothers were practicing EBF at six months (BMIS 2011), and that figure may be overestimated, according to some reports from this study's focus groups. The low rates are understandable given that working women have only three months maternity leave, there is no practice of those working in the fields to take their infants with them, and there are no community crèches.

¹¹ Government of Bhutan Nutrition Program at <http://www.health.gov.bt/doph/ncdd/nutrition.pdf>, accessed 12 May 2013.

¹² The four-month recommendation was mentioned by members of the National Nutrition Core Group; however, the recent IBFAN Country Report on Bhutan mentions that the policy is for 6-months exclusive breastfeeding.

A Baby-Friendly Hospital Initiative has designated a third of Bhutan's hospitals as baby-friendly but has not been able to expand because of inadequate numbers of trained staff, and the initiative lacks a monitoring system. Nationally, marketing of breast milk substitutes is not regulated (IBFAN 2012).¹³

Training of health workers in the feeding of infants and young children that emphasizes breastfeeding and introduction of complementary foods has not been adequate either in-service or pre-service (IBFAN 2012). Not only are training plans in health provider schools and pre-service education program inadequate but no standards for mother-friendly childbirth have been disseminated. There are some in-service training programs, but infant feeding-related content and skills have not been integrated into training programs on such relevant topics as diarrheal diseases, IMCI, family planning, and nutrition. In particular, training of volunteer health workers (VHWs) in infant and young child feeding (IYCF) was rated inadequate. The information, education, and communication (IEC) strategy is to provide technically correct information to improve IYCF, but there is clear need for a behavior change communication strategy directed to caregivers and parents and for training modules on IYCF for VHWs. There also does not appear to be a comprehensive policy or plan for IYCF during emergencies (IBFAN 2012).

Vitamin A is in theory given to all children under 5 along with deworming tablets, yet coverage of children had fallen to 87.9 percent of children in 2008 (NNS 2008) and 48 percent in UNICEF's State of the World's Children report in 2009. Distribution may have become more difficult since the end of National Immunization Days for polio. For pregnant and lactating women, Vitamin A and iron tablets are given along with deworming tablets during ANC visits.

Since 98.4 percent of salt is now iodized, iodine deficiency is no longer considered a public health problem. The main measure of success was the drop in the goiter rate from 65.4 percent in 1983 to less than 5 percent in 2005. The success followed issuance of a regulation that all table salts imported or produced in Bhutan had to be iodized. (GNHC 2011)

Unfortunately, iron deficiency anemia still afflicts 55 percent of women and 80 percent of children.(FNS 2008). Iron supplements are given to all pregnant women during ANC visits, and are given weekly to school girls. However, reports from the FGDs indicate that the preparation presently used is not palatable and that schoolgirls choose not to take it or secretly spit out the tablets.

Capacity in public nutrition is limited. There is one nutritionist in the Ministry of Health, and six dieticians in facilities around the country. The Royal Institute of Health Sciences (RIHS) offers a two-year full-time bachelors program in public health, but nutrition is not part of the curriculum. The basic science curriculum has a module on nutrition and dietetics, and pre-service training for general nurse midwives covers food and nutrition, though the emphasis seems to be on facility-based clinical nutrition. The RIHS has on the faculty a lecturer who has a master's in food and

¹³ See www.ibfanasia.org/SABPF-5/Bhutan-assessment.ppt accessed 19 April 2013

nutrition from Mahidol University in Thailand who is responsible for nutrition, nursing, research, and IYCF practices. In 2013 the RIHS had about 200 candidates for their program.

Among possible MOH nutrition-sensitive programs, the following could have an immediate impact on community nutrition.

8.1.1 Expanded Program for Immunization (EPI)

Launched in 1979, by 1990 EPI had steadily increased coverage to more than 90 percent for most antigens, and coverage remains high (table 8.1 ;WHO 2008)).

Table 8.1: Immunization Coverage of Children and Mothers, 2007, Bhutan (Percent)

Antigen	Coverage
BCG	94
DPT1	92
DPT3	95
POL3	93
MCV	95
HepB3	95
TT PAB ^a	86

Source: Childinfo, accessed at http://www.childinfo.org/files/bhutan_final_august_08.pdf

^a Protection at birth derived from a longitudinal follow-up of cohorts of women followed from infancy through life with total TT protection as a result of maternal immunization received by the mother throughout life, rather than the TT immunization given during the current pregnancy.

Direct impact of these levels of protection on nutrition are at the proximate level of the UNICEF nutritional conceptual framework, where prevention or treatment of disease and provision of adequate dietary intake are the main interventions to prevent malnutrition. Their indirect impact on nutrition is through recognition that keeping coverage consistently high indicates community access to the health care system—access that can be used for education, support, and prevention of nutritional deficiencies. With 95 percent coverage, even remote areas are being reached regularly (see table 8.1).

Table 8.2 shows the current routine immunization schedule in Bhutan, indicating opportunities for contact with the health system where communities, mothers, and children can be evaluated, advised, and treated for nutritional problems. That these contacts are a reality is reflected in the continuing remarkably high levels of immunization that earned Bhutan the GAVI Best Immunization Performance Award in 2009.

Table 8.2: Routine Immunization Schedule, Bhutan, 2009

Vaccine	Age of Administration
BCG	Birth
DTP-Hib-HepB	6 weeks, 10 weeks, 14 weeks
OPV	Birth, 6 weeks, 10 weeks, 14 weeks
MR	9 months, 24 months
TT	1st pregnancy, +1 month, 2nd pregnancy, 3rd pregnancy, 4th pregnancy, 5th pregnancy
HPV	0 months, +2 months, +6 months
Vitamin A	6 months

Source: WHO-SEARO 2012

Bhutan was supported through the sixth funding round by the Global Fund for AIDS, TB and Malaria (GFATM), which ran January 1, 2008, to December 31, 2012. Its program areas were health systems strengthening, timely detection and quality treatment of cases, prevention behavioral change communication community outreach, and support to environment coordination and partnership development.(GFATM 2013) The Bhutan National Tuberculosis Control Program, established in 1976, has helped to significantly reduce tuberculosis (TB) infections, which are now 176 / 100,000, a number essentially unchanged for the last decade (MoH 2012b).

The TB control program has a vital role in nutrition improvement for two reasons:

1. There is a close direct association between TB and undernutrition, particularly anemia associated with TB in pregnancy. The physiologic hypo-immunity during pregnancy can lead to activation of latent TB in pregnant women, causing iron to be diverted to the immune response. Activation of TB is even more pronounced in cases of co-infection with HIV.
2. Driven by the DOTS (directly observed therapy) approach, the TB program represents another opportunity for community outreach to the most vulnerable groups, often the poor and undernourished, who live in remote areas. The DOTS program in Bhutan has found it difficult to reach women, youth under age 18, and people living in rural areas. (The government has pursued a pro-poor policy by treating 70% of TB patients free of charge.)

8.1.2 Oral Health Programs

The MOH has called dental care “the most prevalent and yet unmet health care need of the Bhutanese people at large” (MOH 2007). The government initiated its oral health program in 1998. Oral health providers treat dental problems of children in school and provide dental services in hospitals, all at no charge. There does not seem to be a program, however, to counsel preschool children about oral hygiene or diet or about early diseases of deciduous teeth. The government recently published national professional dental health service standards that noted the

competencies, qualifications, and curriculum for a five-year BDS/DDS training with an additional year of internship (MOH 2007) .

The association between oral health and nutrition is synergistic: infectious diseases of the oral cavity directly affect ability to eat, selection of foods, and hence general nutrition. Like other chronic infections, diseases of teeth, gums, and underlying bone in growing children divert proteins, micronutrients, and even calories needed for growth to support the immune response to infection. Dental caries are a major cause of tooth loss in children, youth, and adults. There is a known association particularly between extended sessions of bottle feeding and tooth decay and loss (“nursing bottle caries” syndrome.) The pain of tooth decay alone is a cause of decreased nutritional intake.

Given this significant relationship between oral health and nutrition, it is notable that nutrition is not on the curriculum for either BDS or DDS students in Bhutan. Though this gap is not confined to Bhutan, given its awareness of the extent of problems in both oral health and nutrition, the country could be one of the first to deal with it in the dental education curriculum and thus in its approach to resolving its nutritional problems.

8.1.3 Reproductive Health Program

The RH program covers FP and MCH, and an increase in trained birth attendance is one of its central elements. As it worked to reduce the high MMR, the government increased the percentage of births attended by skilled birth attendants (SBA) from 24 percent in 2000 to 69 percent in 2011 ((MoH 2012b). The percentage is highest in the Western region (78.7 percent) and lowest in the East (49.2 percent). Presence of an SBA at birth is also related to wealth (34.3 percent in the poorest quintile; 95.1 percent in the richest). The SBA indicator is used as a proxy for maternal mortality to monitor progress toward MDG 5 (BMIS 2011). The program, along with changes in living standards; concomitant improvements in health care, education, and literacy; and increased prevalence of contraception, has also pushed down total fertility rates, which dropped from 4.7 in 2000 to 2.8 in 2011. The SBA, the nurse midwife, the VHW who visits women before and during pregnancy, and the obstetrician are all essential resources for improving the care of women and children during the 1,000-day window. Yet, the program does not seem to have sufficient input of nutrition information and education.

Bhutan only has 12 health care providers with midwifery skills per 10,000 population, barely half the 23/10,000 that is the WHO standard. This figure has motivated a tripartite program between the Bhutanese government, Thailand, and the UN Population Fund (UNFPA) to improve RH service delivery in Bhutan, especially services to adolescents,¹⁴ a key government target group. In January 2013, the MOH began the process of printing the new Adolescent Health Strategy for Bhutan.

In 2008 the MOH, with assistance from WHO (MOH-RGOB 2008), identified major issues associated with adolescent sexual and reproductive health: a survey in 2000 by the Department of

¹⁴ UNFPA News Feature Story, January 21, 2013, accessed at <http://www.unfpa.org/public/home/news/pid/13009> on April 20, 2013.

Youth Culture and Sports in the Ministry of Education had found that 58 percent of high school students aged 15–20 were sexually active; and students and young people were least likely to use contraception (1 percent of students, 2.4 percent of those aged 19–24). The MOH report also noted that 15 percent of girls 15–19 and 0.3 percent of girls 10–14 were currently married (National Population and Housing Census 2005 (RGoB 2011) . It pointed out that adolescents are twice as likely to die during childbirth than those in the safest group (20–24-year-olds), and among those married before age 14, dying in childbirth was five times as likely. In 2008, more than half of women in Bhutan had delivered their first child before age 20 (MOH-RGOB 2008).

These truly vital statistics, coupled with the association between adolescent pregnancy, low birth weight, and later stunting in both adolescent and offspring can be a central piece in solving the puzzle of Bhutan’s malnutrition problems.

8.1.4 HIV and AIDS

The program to prevent HIV and AIDS was started in 1988, but the numbers of infected Bhutanese gradually increased from 38 in 2000 to 270 in 2011. While most infected persons are aged 25–39, the unprotected sexual behavior of adolescents places them at risk. The World Food Programme (WFP) has written about the close association between HIV infection and nutrition particularly as related to food insecurity (see <http://www.wfp.org/hiv-aids/hiv-and-nutrition>). It is also known that adequate nutrition can improve the course of the disease and disease status (Delisle et al. 2000). While the government provides free antiretroviral therapy to all HIV-infected individuals, it is not clear if nutrition messages and interventions have been incorporated into Bhutan’s program. If not, this may represent a gap in the health program that could be closed at this early stage in the HIV epidemic.

8.1.5 Integrated Management of Newborn and Childhood Illnesses

In all 20 of its districts Bhutan has trained doctors and first-level health workers in integrated management of newborn and childhood illnesses (IMNCI). While IMNCI training covers nutrition, it is unclear who is providing this training in Bhutan and if it specifically covers IYCF (WHO-SEARO 2011a). With program coverage as extensive as that in Bhutan, this would offer an excellent vehicle for augmented nutrition training of health workers and communities.

Box 8.1: Nutrition-Related Components of Bhutan’s Early Childhood Care Program

- Vaccination of all children <1 year
- Growth monitoring (once a month for children <1 year and once every 3 months for children 1–5)
- Deworming twice a year for children >15 months
- Vitamin A supplements once every 6 months starting at age 6 months
- Promotion of infant and young child feeding practices
- Integrated management of newborn and child illnesses

Source: Wangchuk and Choden 2011.

In addition, within the Early Childhood Care and Development (ECCD) program initiated in 2004, services in the categories shown in box 8.1 are delivered in hospitals, basic health units, and outreach clinics through an integrated approach that involves both the MOE and the Department of Public Health.

These services will be discussed in the Education section as well; although obviously some ECCD components involve health and nutrition, there is no specific MOH division that is assigned to ECCD. IMNCI is a cross-cutting program that offers opportunities to advance nutrition in Bhutan by tightening the link between education and health in nutrition initiatives and the ability to use the ECCD cadre of workers to reach mothers of young children with messages about birth spacing, pre-pregnancy nutrition, and health care generally.

NUTRITION-RELATED PROGRAMS IN AGRICULTURE AND FORESTS

Because of the close relationship between food production and nutrition security, the ministries of Agriculture and Forests (MOAF) and of Health must work together closely to assure nutrition security. The *Food and Nutrition Security Policy of the Kingdom of Bhutan, 2012*, although not finalized yet, demonstrated the potential for this collaboration.

Of rural households surveyed 35 percent reported food shortages in 2007, of whom just over a little more than half faced seasonal shortages lasting more than four months. They coped by borrowing from households with a food surplus, bartering for food, trading work for food, and borrowing money from remittances or the salaries of employed household members (Maetz 2012). This and the lack of dietary diversity have significant impact on both the macro and micro-nutrition of household members.

One of two programs to alleviate this and to create greater household food security is the Vegetable Value Chain Program, which supports 104 farmers groups in the East of Bhutan (VVCP-East). The second is a promotional program in which the government provides free packets of seeds to farmers for kitchen gardens and household nutrition. VVCP is concerned with semi-commercial farming and marketing; it is a cooperative initiative in which farmers initially share costs with the government. Farmers groups have been successful in providing vegetables to boarding schools and other institutions. Crop choice depends on seasonal growing patterns and the ability to fill a niche in the Indian market during particular seasons, where supplies from Bhutan are still available whereas domestic supplies are not in season.¹⁵

Where commercial production can be encouraged in accessible areas, nutritional promotion programs such as kitchen gardens are targeted at remote areas with less market access. Visitors to villages in remote areas observed that only 25 percent of households had kitchen gardens and what was raised was not very diverse. Teams from Rural Development Training Center (RDTC) and the Dzongkhag agriculture sector have been exploring the feasibility of outreach programs to these areas. Other kitchen garden projects are beekeeping and poultry-raising. Joint programs

¹⁵ Ministry of Agriculture and Forests, Royal Government of Bhutan at <http://www.moaf.gov.bt/moaf/?p=14625>, accessed 19 April 2013

with the MOH Nutrition Section could enhance the impact of these programs on the nutrition of vulnerable women and children in remote areas.

Box 8.2: Rural Development Training Center Training Programs

1. Agriculture skills training
2. Farm skills
3. Group management
4. Study tours to farms and groups of farmers on specific topics
5. Youth agriculture awareness

Source: MOAF.

Another innovative program that could have a very useful connection to nutritional improvement is the training RDTC offers (box 8.2) which is designed to engage older farmers and slowly introduce youth to agriculture that is relevant to their environment so that they can make a living from agriculture. Currently, schools are now producing more graduates than there are jobs outside of agriculture, as a result of

which many graduates migrate to the cities to find employment. The RDTC defines itself as “the knowledge center that is able to meet the skill and knowledge needs of modern- day farmers and contribute to an improved image of the farming profession.”¹⁶ A review of course offerings suggests areas where nutrition could be added to the curriculum for study tours and youth agriculture awareness programs (box 2).

NUTRITION-RELATED PROGRAMS IN EDUCATION

Earlier this report emphasized the close connections between education and health: the importance of keeping girls in school as a means of delaying marriage and adolescent pregnancies through peer social engagement and teaching them how to prepare for adulthood; ECCD, with its potential to influence nutrition throughout the critical first two years of life; and the importance of learning about both the health aspects of reproductive and sexual health and the social responsibilities that accompany adolescent sexual behavior. There is also potential for schools to teach the theory as well as the practice of good personal hygiene.

Another program that could have considerable impact on public nutrition is school health clubs. These generally have a school captain and a teacher who supervises and coordinates health activities for the school. The Department of Youth and Sports also trains peer helpers for grades 5–8 (junior secondary school) and 9–12 (senior secondary school) who work with school guidance counselors. Their curriculum has four units: Understanding Self and Others, Understanding Health, Gender Awareness, and Vision for Future. The Department of Youth and Sports also publishes a magazine, *Youth Digest*, that is sent to all schools twice a year. These programs and publications offer a rich structure for dissemination of public nutrition messages and a means of monitoring progress in such areas as hygiene and sexual education.

In discussions with the Ministry of Education, its staff expressed considerable interest in educating teachers as well as students in public nutrition, exploring their potential to motivate

¹⁶ Ministry of Agriculture and Forests, Royal Government of Bhutan, at http://www.moaf.gov.bt/moaf/?page_id=133 accessed on 19 April 2013.

behavioral change in their communities. An important corollary of this idea was the ability of school children to reach out-of-school children and their families with messages about nutrition, health, and hygiene.

NUTRITION-RELATED PROGRAMS IN RURAL WATER SUPPLY AND SANITATION

In 1974 RWSS was established as part of the Public Works Department, but because of its relevance to health, in 1998 it was moved to the MOH as the Public Health Engineering Section (PHES). The response to the 1992 King's Royal Decree that all households should have a proper toilet was successful. The sanitation and clean water initiatives have achieved remarkable results in terms of infrastructure. However, there are suggestions that investment has dropped and that the national government, satisfied with the initial rapid increase in toilets constructed using resources from both external donors and communities themselves, no longer gives sanitation priority. Because most funding is external, its expansion and sustainability are threatened (personal communication).

The program is distinguished by its participatory approach, community cost-sharing, and community management. Institutional water supplies and sanitation are provided to schools, religious institutions, and road camps. It is also well networked with other programs, such as the Comprehensive School Health Program and the VHW training program. Because of the heavy use of water for agriculture and power generation and their competition with each other and with domestic use of water, PHES must coordinate with the relevant ministries to ensure that water use by each is balanced and sustainable. From a human resource development perspective, the PHES supports community management organizations through caretaker training, which has led to an expansion of training and number of PHES staff. It is also active in promoting hygiene (MOH-RWSS 2001).

There is a recognized relationship between the adequacy of water and sanitation facilities in schools and retention of girls in upper secondary classes. Inadequate facilities can lead to discrimination against girls, particularly during menstruation, making them reluctant to go to class. Some children who do not practice good personal hygiene because they come from poor households or homes where the facilities are not adequate for good hygiene have a difficult time in school, particularly if their schools also lack facilities (UNICEF-ROSA 2009).

The RWSS is clearly a program that has enormous impact on health and nutrition, but in PHES materials though there is considerable discussion of hygiene and diarrheal diseases there is not much about how better water can reduce infections and contribute to normal growth, or about how washing hands with soap and water can reduce the incidence of the two major childhood illnesses, diarrhea and pneumonia, by more than 50 percent (Luby et al. 2005). Nor is there mention of tropical enteropathy, *H. pylori*, or other products of an unsanitary environment as serious causes of undernutrition. Still, the PHES has staff in the field who with some training could possibly use the connections between diseases, the environment, nutrition, and

development to enlist greater ownership by the community in its otherwise very successful activities.

PROGRAM GAPS AND OPPORTUNITIES FOR NUTRITION

8.1.6 Human Resources

At present, as noted, MOH personnel trained in nutrition are limited to one nutritionist at headquarters and six dietitians stationed around the country. The lack of specialist staff is felt in program planning, implementation, and monitoring and evaluation. Without trained staff, nothing can be done, and no one will have the necessary data to make decisions to improve the situation.

There would be a benefit to training workers already in the health system to maximize nutrition-related elements that already exist in their work. The health assistant job description (JD; see annex B) is an example of a position where capacity in public nutrition could be enhanced for the benefit of the Basic Health Unit (BHU) and the community. The JD states the purpose of the position as being to provide curative, preventive, and promotive services to the BHU population. The educational requirement is a two-year RHIS Diploma in Health Sciences or Midwifery. The Duties and Responsibilities section lists “implementing community health programs like water and sanitation, nutrition, communicable disease control, etc., through involving community leaders and organizations at the community level.” It is not only possible but necessary to increase the knowledge of health assistants in public nutrition through two routes: in-service training and finding ways to insert public nutrition into the curriculum, e.g., by augmenting the training in food and nutrition presently in the curriculum; adding it into on-going courses; or creating a dedicated course on public nutrition.

The capacity of workers in other programs and ministries could be upgraded to maximize their contribution to nutritional improvement in the community (see box 8.3 for examples). In almost all cases, those with experience with or knowledge of nutrition see the problem mainly as one of food and food security, or as a clinical (individual) problem. To solve the complex, multisectoral problems of anemia and stunting, however, a population-based approach will be needed.

Box 8.3: Staff Potentially Available for Building Public Nutrition Capacity

1. ECCD
2. IMCI
3. Midwives
4. Dentists and dental assistants
5. DOTS outreach workers
6. EPI outreach workers /campaigners
7. Agriculture researchers and field staff
8. School teachers
9. RWSS/ PHES staff

8.1.7 Programs Amenable to (More) Nutrition Content

There are already programs and encounters with the community where messages about public nutrition, using the evidence-based content of the SUN movement and the concept of the Window of 1,000 Days, could be transmitted effectively. Table 8.3 gives some suggestions.

Table 8.3: Adding Nutrition Content to Active Programs

Program	Content
ECCD	Emphasize the Window of 1,000 days in observing and educating children <24 months. Help ECCD staff to better understand the critical importance of growth during this period, and the relatively lesser importance of focusing on nutrition of children aged 3–5. Teach ECCD staff about the dangers of formula feeding.
RWSS	Train and raise awareness about the topics noted for ECCD plus the importance of keeping women, whether or not pregnant, disease-free and well-nourished, so that they are in good health and well-nourished when they become pregnant. Explore increased collaboration in community management organizations between RWSS/PHES staff and Department of Nutrition, Ministry of Health as entry points into even remote communities, and work with PHES to draft a suitable curriculum.
Education <ul style="list-style-type: none"> • School health clubs • Peer helpers • School teachers • Guidance counselors 	Provide information on the Window of 1,000 Days and the importance of health and nutrition before and throughout pregnancy. Expand the views on nutrition of students and faculty beyond simply food. Train them people to educate their peers and communities about the double burden of malnutrition in Bhutan in the form of obesity and overweight. Emphasize the importance of preventing adolescent pregnancies.
RDTC research group	Interest the MoAF in adding more public nutrition content (see above) to its curricula for young people and farmers. Explore joint research (Nutrition/MOH with MoAF) into (1) whether kitchen gardens can provide the needed micronutrients; and (2) backyard sources of iron-rich foods, not only animal sources.
EPI	To achieve 95 percent coverage there should be regular contact with nearly every household in the country no matter how remote. Equip each immunization staff member with information and materials to deliver about the 1,000 days and the importance of women’s nutrition.
Health <ul style="list-style-type: none"> • Health assistants 	Same as EPI: This key staffs, who are the link between the BHU and the community, could be a valuable and convincing source of public nutrition advocacy.
Reproductive Health <ul style="list-style-type: none"> • Midwives • Skilled birth attendants 	Like EPI and health assistants: 77 percent of women have <i>at least</i> four ANC visits, and 64.5 percent have skilled attendance at birth. These are contacts where nutritional messages and interventions could help reduce anemia, and increases exclusive breastfeeding. They should give more emphasis to EBF, adolescent health, and prevention of adolescent pregnancies.
Tuberculosis <ul style="list-style-type: none"> • DOTS outreach workers 	Because outreach workers reach a high-risk population, they could prevent, diagnose, and even treat malnutrition, which is also important for recovery from TB.
HIV IMNCI	Explore how more public nutrition / clinical nutrition content could be incorporated into these programs—content that goes beyond simply severe or moderate acute malnutrition.
Oral Health	Add public nutrition to the dental curriculum. Advocate against use of any form of infant formula or breast milk substitute.

9 CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The major issues that prevent Bhutan from overcoming its persistent problems of undernutrition can be assigned to four spheres: (1) the individual and the community where malnutrition is manifest; (2) the workforce available to address the problem; (3) the organization of support for workers; and (4) the environment at the national level and beyond that encourages programs to correct undernutrition.

More attention is needed to address and guarantee the health and nutrition of individual women before, during, and after pregnancy. At present, most attention is directed to the pregnant woman, but if children are to be protected during the 1,000 days of maximum vulnerability (from the child's conception to age 2); more attention is needed for women before they become pregnant so that they can become and stay pregnant disease-free and without nutritional deficiencies. Communities also have to be made aware of stunting and anemia, the most compelling nutrition problems. Both have major impact on the growth and physical and intellectual development of the individual and on the growth and development of the nation; it appears from the FGDs that both are presently invisible to the community: When a high proportion of children are stunted, each stunted child looks normal. And anemia is not visible at all until it is severe.

The lack of understanding of the impact of certain traditional practices is seen in the use of alcohol during pregnancy and lactation, which needs a more forceful communications effort. Other behavioral change communication areas that need attention are the persistence of open defecation in some areas, and the lack of knowledge of when to start complementary foods and what they should be. These are not complex concepts; poor practices and lack of understanding simply reflect the depth of embedded traditions. The focus on the community is of critical importance, because that is where change in the system must start through new awareness and commitment to change.

Bhutan needs to recognize that nutrition is a population-based problem. To raise the necessary community awareness will take a workforce of health workers and volunteers who are knowledgeable about public nutrition. At present the nutrition workforce in Bhutan consists of only a few staff in the field whose expertise is in clinical nutrition and dietetics and who emphasize individual care. Much can be accomplished in the short and medium term by adding training in public nutrition to the curriculum of current community-focused staff in health, agriculture, RWSS, and education and by adding public nutrition interventions to job descriptions. In the short term, training can be in-service; in the medium term, topics relevant to public nutrition must be added to pre-service curricula. Trainers and senior staff with expertise in public nutrition can at first be imported from regional institutions, local staff can be trained there in short courses, perhaps three months, or both. Eventually, RIHS will need to add to its faculty specialists for sustainable addition of public nutrition content to its courses, both undergraduate and graduate.

Currently, programs that could have an impact on nutrition are fragmented and not well-coordinated, which means they are not fully effective. Exacerbating this disjuncture is the absence of a nutrition monitoring system that could collect the data necessary for local decision-making. At present, most decisions are taken on the basis of survey-collected data that may be up to five years old. This is not a system sensitive enough to allow program managers to make corrections or revisions to programs in order to improve the results.

A multisectoral approach is essential because the problems are multifactorial. The origins of malnutrition go far beyond one sector. That is why it is useful to differentiate between direct nutrition-specific causes of undernutrition, where the health sector has the leading role, and indirect nutrition-sensitive causes and interventions that must bring in areas like agriculture, education, and rural development. While each sector may feel it does not have enough field staff, bringing them together around common goals and objectives can be a multiplier of coverage, since each works with the same communities, and often the same community workers. This approach is at an early stage in Bhutan with the formation and activities of the Nutrition Core Group. However, if it is to be effective, it needs a forceful mandate from the highest level. No interdisciplinary approach will be successful if it is initiated only by one line ministry. At present, fortunately, the MCG is under the Gross National Happiness Commission, which can provide it with that mandate. To be effective, however, the GNHC should clarify the roles of each sector in addressing undernutrition and assign accountabilities to each so that how sectors deal with undernutrition can be monitored and reinforced.

This will require a policy environment that encourages and enables the necessary changes. Awareness at the policy level that the problem is serious may not be enough. A national advocacy campaign is needed to educate all Bhutanese about the serious consequences to the economy, to national development, and to gross national happiness if malnutrition in Bhutan goes uncorrected.

On a smaller scale, the country still needs a national nutrition policy that links together health, agriculture, education, and rural water supply and sanitation. This must be a consensus document with ownership by all ministries affected, not just one. Identifying three to four districts (or *geogs* as noted in the Agriculture recommendations below) in the East and South, where nutrition indicators are particularly poor, in which to implement recommendations—with a monitoring system that will generate lessons learned for other districts to use—would offer a measured and effective approach to the problem.

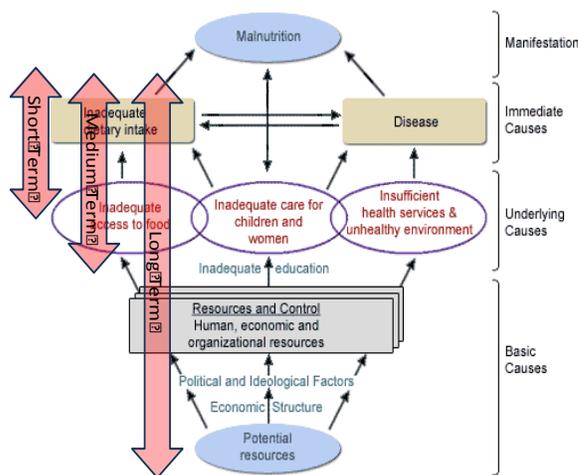
The major systemic gaps that must be filled if Bhutan is to overcome its persistent undernutrition problems are summarized in the following recommendations. They cover the entire spectrum from national policy to the pragmatic, such as changes in the quality of the iron supplements given weekly to schoolgirls. Each element is necessary if the problem is to be resolved. Short-, medium-, and long-term identify the impact horizon—when the country can expect to see results. All must be started immediately if the problem is to be resolved in an effective, efficient, and sustainable way.

A full assessment of capacity may also be necessary to guarantee the practicality of each recommendation and to identify where the system needs reinforcement in order to adopt these recommendations. This would assess the capacities of individuals in home and community settings to learn about the problems and act on the recommendations; the capacity of workplaces and organizations to provide the necessary jobs, materials, and technical support; and the public nutrition systems related to policy and financing that are needed to support the initiatives effectively.

SELECTED PRIORITY RECOMMENDATIONS

If stunting and anemia in Bhutan are to be improved and the improvements sustained, interventions will need to be directed at all levels of causality (see figure 9.1) and the many sectors involved in this problem.

Figure 9.1: Starting Points for Short-, Medium-, and Long-term Interventions



As seen in Figure 9.1, interventions may be short-term (measurable change within 1–2 years), medium-term (2–5 years), or long-term (5–10 years). However, regardless of when the ultimate impact will be seen, efforts to initiate each intervention should all start at the same time in recognition of their mutual support and impact. Delayed initiation of medium- and long-term interventions will only push their achievement further into the future. In that sense, they are all of equal priority, but it can be important to gain traction and generate political support by making some short-term interventions a priority. Politicians, donors, leaders of NGOs, and UN

agencies all must report back to their constituencies if funding for current projects is to be sustainable.

For this reason, Table 9.1 lists immediate short-term recommendations that could create measurable change within two years. Some process recommendations are of equal importance but will take longer (for example, building the nutrition capacity of all staff). These are described in detail later in the sector-specific recommendations.

Table 9.1: Priority Recommendations for Short-term Results

Sector	Problem	Recommendation	Expected Result
Health	When girls in school are given weekly iron supplements, reportedly they are spitting the tables out or not taking them as they leave an unpleasant, rusty taste in their mouths.	<ul style="list-style-type: none"> • Adopt one of the newer, more palatable iron tablet formulations that are widely available. • Expand weekly iron/folate supplements to girls aged 15–24 to improve their iron and folate status before pregnancy. • Consider extending iron supplements to lactating women through the first two years after the child is born. 	Reduced prevalence of anemia in women.
Health Trade Agriculture	Decisions have not been taken on the double fortification of salt and on fortification of other food substances, such as rice or oil, with essential vitamins and minerals. Given Bhutan’s success with salt fortification, rice or oil fortification is likely to be acceptable and successful.	<ul style="list-style-type: none"> • Do a rapid market analysis of rice imports and of the domestic rice and oil industry to find out whether fortifying these foods is feasible. • Do further market surveys to determine whether consumers will accept double-fortified salt. 	Reduced anemia in women and children.
Health	There seems to be no coordination of the many nutrition-specific or -sensitive interventions. As a result, implementation is fragmented, coordination is poor, and monitoring and evaluation (M&E) are very difficult, particularly since there is no nutrition M & E plan in place.	<ul style="list-style-type: none"> • Adopt an evidence-based package of nutrition interventions that can be made available to every citizen. • Integrate into the HMIS monitoring indicators (process and output) that can be measured. 	Improved IYCF, maternal nutrition, and nutrition of pre-pregnant women.
Health Education Agriculture RWSS	Communities are not aware of nutrition problems and their implications.	Organize a bi-annual inter-sectoral <i>Community Nutrition and Happiness Day</i> that is planned and implemented jointly by staff from Health, Education, Agriculture, and RWSS.	Better nutrition, disease identification, personal and environmental hygiene, and dietary diversity
Education Health	Rates of adolescent pregnancy are high and contraceptive use rates are low, despite high levels of secondary education for girls.	With the Ministries of Health and Education working together, draft a comprehensive life-skills course on adolescent reproductive and sexual health and make it part of the school curriculum, supported by increased access to contraceptives for both girls and boys.	Fewer adolescent pregnancies, heavier babies, and less stunting. Improved nutrition for pre-pregnant women.

SECTOR-SPECIFIC RECOMMENDATIONS

Below are recommendations to alleviate the major problems identified in the section on key determinants of stunting and anemia. Although the entire list is long, the problems to be addressed by each sector are limited in number.¹⁷ Some of the interventions recommended are already part of the government strategy (for example, ANC and IYCF are a major focus of the reproductive health and nutrition programs), but they are not coordinated in a mutually reinforcing way. Hence, the overarching recommendation is to adapt an evidence-based *package* of nutrition interventions that can be made available for each citizen.

9.1.1 Health

1. **Problem:** *The many nutrition-specific or -sensitive interventions are not well-organized, so that implementation is fragmented, coordination is poor, and M&E is very difficult, particularly since there is no formal nutrition M & E plan in place.*

Recommendation:

- Adopt an evidence-based package of nutrition interventions that can be made available for each citizen, based on the package described in the Scaling Up Nutrition (SUN) collaboration developed in 2009. This includes: iron/folate tablets for pregnant and lactating mothers; deworming of children; nutrition counseling during ANC visits; provision of oral rehydration solution (ORS) with zinc for diarrheal diseases; counseling to improve EBF rates and timely introduction of appropriate complementary foods; provision of multi-micronutrient powders for malnourished children; salt fortified with iron as well as iodine; and fortification of other foods, such as rice and oil. The number of families receiving this package could be added to the Health Management Information System (HMIS) as an indicator of nutrition program coverage.
2. **Problem:** *Because indicators of malnutrition are not readily accessible or known by many professionals, they may be either not monitored or underreported.*

Recommendations:

- Review and clarify nutrition indicators in the present HMIS to make sure they reflect the latest nutrition findings.
- Use the growing reach of mobile phone technology to empower community groups to report on their own indicators of overweight and obesity as well as underweight, stunting, and anemia so as to increase efficiency and accuracy of data reported in all regions.
- As a medium-term strategy, put in place a Nutrition Monitoring and Information System to measure progress on indicators related to EBF, IYCF, implementation of the Code of Marketing of Breastmilk Substitutes (a policy recommendation), community growth monitoring data, etc., as recommended in the IBFAN report.

¹⁷ Number of problems by sector: Health = 8; Agriculture = 6; Education = 3; Rural Water and Sanitation = 1; GNHC = 3; Gender (NCWC) = 1.

3. **Problem:** *There is not enough specialized staff at any level in public health nutrition. At present, the MOH has only one nutrition specialist and six facility-based dietitians. The two-year bachelor of public health course offered by RHIS does not have a nutrition component. The food and nutrition module in the nurse midwife program seems to be heavily clinical.*

Recommendations:

- Move promptly to build capacity in nutrition. Having a staff member trained in public nutrition in each district will be essential, and eventually it may be necessary to increase the number of national staff with primary responsibility for nutrition.
- Review and revise job descriptions as needed to identify public nutrition responsibilities for each position.
- At the same time, with the Royal Institute of Health Sciences (RIHS), draw up plans for in-service training in public nutrition to fill in gaps as needed to perform jobs as described. Train all BHU staff, HAs, and CHWs in public nutrition through short courses, with reinforcement and updates twice a year.
- Provide special training for HAs to expand their accountability to report nutrition indicators and enhance their role in community nutrition education.
- Because Bhutan will never have enough jobs to support a public nutrition degree program, regularly send four or five staff with some nutritional background overseas for short courses or for a one-year diploma program in public health nutrition.
- Do a comprehensive assessment of nutrition capacity in Bhutan (similar to those being done in other South and Southeast Asian countries (such as Bangladesh, Indonesia, Laos, Nepal) to guide efficient use of resources.
- Explore training programs where public nutrition could be inserted into curricula, as in dental schools and the RTDC.

4. **Problem:** *Anemia persists despite iron supplementation for women and schoolgirls. Girls are reportedly spitting out or not taking iron tablets because they leave an unpleasant, rusty taste in their mouths. High levels of anemia in women, both pregnant and non-pregnant, indicate (1) inadequate compliance with iron supplementation programs; (2) possible inefficient absorption of iron supplementation due to competing bacterial and parasitical infections, or competing ingestion of inhibitory substances (i.e., polyphenols in tea); and (3) high dietary intake of non-heme iron. High levels of anemia in children aged 6–12 months reflect poor iron stores in pregnant and lactating women and inadequate iron content in complementary food.*

Recommendations:

- Change the iron tablet formulation to newer, more palatable forms, which are readily sourced.
- Expand weekly iron/folate to girls aged 15–24 to improve the iron and folate status of women before pregnancy.
- Consider extending iron supplements to lactating women through the first two years after childbirth.

- Create BCC materials with dietary recommendations to (1) increase animal protein and heme sources of iron; (2) reduce consumption of tea during meals (i.e., shift to between meals); and (3) increase vitamin C-containing foods in meals.
 - To help reduce infant anemia, train nurse midwives and other birth attendants in delayed clamping of the umbilical cord during all deliveries to increase iron stores in neonates.
5. **Problem:** *Present encounters of health personnel with women and children are not being used maximally to improve nutrition knowledge or practice; communities are unaware of nutrition problems such as stunting or lack of exclusive breastfeeding. Surveys and reports suggest there is no comprehensive BCC policy or strategy for IYCF and other elements of women's nutrition.*

Recommendations:

- Formulate a comprehensive BCC strategy for nutritional improvement that can guide campaigns, media, and community educational materials and events to improve the nutrition of women and children. The strategy could emphasize messages directed to alleviating persisting behavioral challenges, such as alcohol use during pregnancy and lactation, open defecation, and feeding with inappropriate complementary foods.
- Focus the communication strategy around the package of nutrition services (as per the SUN initiative) outlined above.
- Consider instituting a nationwide annual or semi-annual *Community Nutrition, Health, and Happiness Day* for all communities. Use the day for (1) nutrition interventions, such as community growth monitoring by length/height; delivery of vitamin A supplements and deworming tablets; and giving women of reproductive age a four to six-month supply of weekly iron/folate tablets; (2) health interventions, such as identifying women with iron-resistant anemia and referring them for treatment of *H. pylori*; providing a supply of perhaps three ORS packets with sufficient zinc tablets to cover likely bouts of diarrhea; filling in missed immunizations; training on importance of nutrition and diarrhea, TB/HIV, etc.; and (3) education of community members in the importance of micronutrient nutrition through balanced diets and dietary diversity, importance of hygiene and sanitation, avoidance of unwanted pregnancies especially in adolescence, importance of nutrition and disease prevention before pregnancy, the key elements of the 1000 days of vulnerability (i.e., nutrition from conception through the second year of life), among others.
- Link the MOH Nutrition section more closely with peer helpers and school health clubs to organize the *Community Nutrition, Health, and Happiness Day*. Involve adolescents and young people in training others in adolescent nutrition and reproductive and sexual health; consider distributing contraceptives.
- Link MOH with MoAF through, for example, a “farmers’ fair” where farmers can be recognized for good crops and ideas can be exchanged on farming methods, food self-sufficiency, etc.
- Link MOH with RWSS: demonstrate toilet designs that are low-cost but acceptable to the community, and offer education sessions on hand-washing and personal hygiene. Use any activity and training for extensive community education on public nutrition. Making

- households self-sufficient in basic nutrition and health care would be especially appropriate for remote villages (*geogs*).
- Produce written and audiovisual materials to help community health workers to counsel women during ANC visits and on immunization days about improving their own and their children's nutrition and their personal and environmental hygiene.
 - Work with teachers to improve community educational materials (see Education recommendations below).
 - Work with community support groups to understand impediments to EBF, such as the need for breastfeeding mothers to take their children with them when they work. Support MOH advocacy for changes in national policy about maternity leave and crèches at work sites to accommodate six months of EBF.

6. ***Problem:*** *Decisions have not been made about double-fortifying salt and fortifying other foods, such as rice or oil, with essential vitamins and minerals. The success of salt iodization indicates community acceptance of fortification programs but they require government regulation to forbid importing or producing unfortified products.*

Recommendations:

- Do a market analysis of rice imports and the domestic rice and oil industry to establish whether fortifying these foods is feasible. Given Bhutan's success with salt fortification, rice or oil fortification is likely to be acceptable and successful.
 - With GNHC Nutrition Core Group leadership, begin as a medium- to long-term intervention to draft legislation for fortification of rice; since half of rice consumed is imported, legislation as well as negotiation with Indian suppliers will be required.
 - Do market surveys to determine whether consumers would find double-fortified salt acceptable. Community feedback in the FGDs suggests that dual fortification with iron as well as iodine will be accepted if the color does not change significantly. Efficacy trials of double fortification in India have succeeded in reducing iron deficiency anemia, despite perceived changes in color. However, these studies were done along with intensive nutrition education and a free supply of double-fortified salt (Andersson et al. 2008; Zimmermann et al. 2004)
7. ***Problem:*** *Obesity and overweight are rapidly increasing in Bhutan; in pre-school children the rates are now above the regional average. Both are more prevalent in urban than in rural environments, suggesting that the problem may be related to lifestyle choices and the greater availability of processed calorie-dense foods in cities.*

Recommendations:

- Talk about the double burden of nutrition in all BCCs and in training materials. Focus particularly on urban areas.
- Incorporate indicators for overweight and obesity into all management information systems.
- Design a communication campaign for fitness and improved diet aimed at urban centers.

8. **Problem:** *Not enough attention is given to the nutrition of non-pregnant women; most attention starts when a woman declares her pregnancy in the second or third trimester. If the Window of 1,000 Days is to be addressed effectively, more attention must be given to women before they become pregnant, particularly since poor nutrition of women in early pregnancy is implicated in stunting in children.*

Recommendations:

- Draft a simple and readable *Woman’s Guide to Nutrition*—separate from the current *Mothers Handbook* for pregnant women and mothers—that contains advice on nutrition and health for women of all ages.
- In addition to expanding weekly iron/folate to women aged 15–24, offer weekly iron tablets to all women living in areas where anemia is endemic.
- Train VHWs to be attentive to the nutritional needs of young women, particularly before their first pregnancy.

9.1.2 Agriculture

1. **Problem:** *At present there is no national food and nutrition policy. The MoAF has drafted a food and nutrition security policy with inputs from the MOH but the Cabinet has asked for modifications. The policy is stronger on food security than on nutrition security.*

Recommendations:

- Work within the Nutrition Core Group to ensure that the National Food and Nutrition Policy is multisectoral.
- Intensify the nutrition security component in the current draft and enlist the support of other ministries to get the policy passed.

2. **Problem:** *Because agriculture programs are spread across the country, they may not have maximum measurable impact on high-risk areas.*

Recommendations:

- Target the 20 most vulnerable *geogs* based on anemia prevalence in men as a robust indicator of food insecurity, and undertake a joint MOH/MoAF anemia reduction program that addresses food insecurity, livelihoods, dietary diversity, and increased access of children and women to animal sources of protein and micronutrients (for example, eggs), as well as other elements of the evidence-based nutrition package.
- Measure baseline prevalence and identify treatment and control *geogs* so as to assess not only changes in undernutrition, anemia, and food insecurity but what has brought about each change. Comparison groups could be based on an intent-to-treat or step-wedge design to guarantee that interventions would eventually reach all households.

3. **Problem:** *Even in areas with relative food security, 35 percent of rural households reported food shortages for three to four months each year. Shortages are more common in the East and South regions. Lack of storage and varied practices of food preservation lead to food wastage and contribute to seasonal shortages; not all families have home gardens, there are*

no systems for food sharing, and some households are not aware of appropriate food substitutes during lean months.

Recommendations:

- Survey food wastage levels and assess causes. Work with communities on strategies to reduce food waste and improve storage and preservation methods.
- Use the RDTC to educate communities on food storage and preservation methods, increasing kitchen garden yields, and other public nutrition–related topics.
- Educate communities about substitute foods during food shortages.
- Experiment with communal “food basket” programs to supplement consumption by poor families during seasonal shortages.

4. **Problem:** *The feminization of agriculture increases women’s workloads and caloric expenditure and deprives them of time for childcare and nutrition.*

Recommendations:

- Does time/work/caloric expenditure study of women in rural areas so that strategies to relieve the work burden can be based on evidence?
- Using the research capacity of the MoAF, and possibly the research interests of the Ugyen Wangchuck Institute for Conservation and Environment, consider initiating operations research into zero-tillage agriculture on a limited scale (Fukuoka 1985; Govaerts et al. 2005). Zero-tillage agriculture has been used in a variety of climates and is particularly effective where soil erosion is a problem or water supplies are intermediate. It is known to reduce the workload of farmers while over time producing the same or greater yields of crops. It is particularly effective for growing wheat, maize and buckwheat. Some believe it is the key to food security.¹⁸

5. **Problem:** *In Bhutan there is little intake of foods with iron bioavailability and a lack of dietary diversity. FGD feedback suggests two problems: the high cost of meat and animal products, and their unavailability in rural areas, since meat, which is often imported, is available only in urban markets.*

Recommendations:

- Work on a joint program with MOH advocating and facilitating current MoAF kitchen garden projects, such as support to beekeeping and poultry-raising.
- Have MOH team with RDTC on joint training programs with content on public nutrition that could reach both old and young farmers and their families.

6. **Problem:** *Rapid urbanization is reducing rural agriculture productivity, increasing the migration of youth to the cities, and increasing the exposure of urban dwellers to processed, calorie-dense imported foods that increase rates of obesity and overweight.*

¹⁸ See *No-Till Farming holds the Key to Food Security* at <http://chimalaya.org/2013/03/05/no-till-farming-holds-the-key-to-food-security/> accessed on 12 May 2013.

Recommendation:

- Draft joint MoAF–MOH long-term strategies for urban farming and agriculture (for example, roof-top and vertical gardens) to bring an urban food supply closer to consumers; this could also reduce the alarming increases in the prevalence of overweight and obesity by reducing the dependence of urban dwellers on processed foods.
- While recognizing the risk that educated rural youth may still choose to migrate to the cities, support initiatives to increase higher education opportunities in agriculture (for example, through farm schools and agriculture universities) so that new knowledge will be relevant to an agrarian society.

9.1.3 Education

1. **Problem:** *Rates of adolescent pregnancy are high and contraceptive use rates low despite high levels of secondary education for girls.*

Recommendation:

- Work with the MOH to create a comprehensive life-skills education course as part of the school curriculum, with increased access to contraceptives. Also, intensify efforts to identify girls who are not attending school or who have dropped out, and design re-entry strategies for school dropouts.
- Non-formal education programs, which are largely literacy-oriented, presently reach women over 25 but may not reach younger women vulnerable to early marriage and pregnancy with the kind of RH information needed to prevent early pregnancy. Consider changes in the curriculum and targeting of these programs to meet this need.

2. **Problem:** *Communities lack knowledge about nutrition.*

Recommendation:

- Expand the scope of school health clubs to cover nutrition-specific or -sensitive subjects and establish health and nutrition clubs where they do not yet exist. Expand the mandate of such clubs to the entire community, not just peers in schools, as the target population for education and change.
- Train teachers and students as agents of change within the community.

3. **Problem:** *The present health sciences curricula may be outdated and not reflective of or sensitive to new knowledge about nutrition.*

Recommendation:

- Have the ministries of Education and Health updated curricula for education about nutrition at all educational levels in order to build the capacity of both teachers and students.

9.1.4 Rural Water Supply and Sanitation (RWSS) Department

Problem: *Environmentally determined diseases such as diarrhea and *H. pylori* are still prevalent throughout Bhutan. Although reported by only 5 percent of the population (UNICEF/WHO 2012)*

open defecation is still practiced and may be underreported (Collett 2010). This facilitates transmission of diseases that have significant stunting and anemia effects.

Recommendation:

- Step up education on the importance of stopping outdoor defecation and of hand washing. Expand methods presently being used in other countries, such as Myanmar, where because families design and construct their own toilets, they feel increased ownership and use them more (UNICEF personal communication).
- Demonstrate hand-washing with soap on child health days.

9.1.5 Planning and Cross-Sectoral Actions

1. **Problem:** *The national Nutrition Core Group (NCG) needs coordination and an oversight body with a new national mandate. To work effectively, intersectoral work requires more authority; individual ministries cannot make demands on other ministries unless all are working to achieve recognized national goals.*

Recommendation:

- Clarify the role of the GNHC, already a member of the NCG, as the coordinating body of the NCG. Also, following the successful experience in Thailand where the Crown Princess was involved in advocating for improvements in nutrition, Bhutan might enlist the support of a national nutrition champion at the highest level of government and society.
 - Recruit RWSS representation in the NCG set up during this assessment.
 - Draft joint community-based curricula (now being done by individual sectors) with the Health, Education, and Agriculture ministries and the RWSS department.
2. **Problem:** *GNHC drafting of the 11th FYP is moving quickly, making it essential that public nutrition issues be timely presented for inclusion, along with recommendations.*

Recommendation:

- Intensify intersectoral input on nutrition to the committee drafting the 11th FYP to guarantee that concerns identified and recommendations produced by this review are included.
 - Maximize the impact of these in the NCG and mandate GNHC oversight of the NCG.
3. **Problem:** *Policies for exclusive breast feeding (EBF) are not clearly defined; use of infant formula is increasing.*

Recommendations:

- In the 11th FYP, clarify that the standard of EBF is extended from the present four months to six, in accordance with WHO/UNICEF recommendations.
- Advocate for enforcement of the International Code of Marketing of Breast milk Substitutes.

- Support the MOH in its advocacy to extend maternity leave to accommodate six months of EBF.

9.1.6 Gender

***Problem:** Unlike neighboring countries, there is no general gender-based nutritional discrimination. However, socially embedded gender issues need critical attention as they impact on health-seeking behavior, access to health services, and cultural practices, such as domestic violence. There is insufficient recognition of the relationship between gender and nutrition. Stunting, anemia, low birth weight, and even the high maternal mortality rate are all related to the nutritional status of women*

Recommendations:

- Encourage the National Commission on Women and Children to repeat the study of Violence against Women with special attention to its impact on nutrition.
- Working with the health and nutrition sectors, and interested international partners, do a general study of gender and nutrition in Bhutan.
- Ensure that the 11th FYP has a strong focus and analysis of gender.

10 APPENDIX A: NUTRITION CORE GROUP

Bhutan National Nutrition Assessment and Gap Analysis Core Working Group			
S. No.	Name	Designation & Organization	Email Id
1	Dr. Dorji Wangchuk (Patron)	Director General - Public Health, MOH	drdorjiw@health.gov.bt
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6	Passang Lhamo	Lecturer, RIHS	splham@gmail.com
7	Sherub Gyeltshen	Planning Officer, GNHC	sherub@gnhc.gov.bt
8	Kinley Zam	APO, PPD	kinleyzam@health.gov.bt
9	Pemba Yangchen	PO, DoPH	pambayangchen@health.gov.bt
10	Pema Thinley	PPD/ MoAF	pemat@moaf.gov.bt

11 APPENDIX B: HEALTH ASSISTANT JOB DESCRIPTION

ROYAL GOVERNMENT OF BHUTAN ROYAL CIVIL SERVICE COMMISSION

1. POSITION DESCRIPTION

1. JOB IDENTIFICATION:

- 1.1 Position Title: Health Assistant I (HA)
- 1.2 Position Level: S1
- 1.3 Major Group: Medical Services Group
- 1.4 Sub-Group: Public Health Services
- 1.5 Job Code No.: 15.680.11
- 1.6 Job Location (*Complete as appropriate*):

Ministry: Health

Department: Medical Services

Division: Health Care and Diagnostic Services

Section: Dzongkhag

Administration Unit: Basic Health Unit

- 1.7 Title of First Level Supervisor (*official title of supervisor*): Sr. Health Assistant

2. PURPOSE, DUTIES AND RESPONSIBILITIES (*Describe the purpose, duties and responsibilities, indicating what is done and how it is done. Purpose should be a short statement linking the position to the mission and goals of the organization and specifying outputs of the position. Duties should be presented in decreasing order of percentage of time spent on them, or in order of relative importance:*

Purpose: The purpose of the position is to provide curative, preventive, and promotive services to the population in a Basic Health Unit (BHU).

Duties and Responsibilities	% of Time
<ul style="list-style-type: none"> ▪ Provides safe medical care to all patients under his/her care by following standard treatment protocols. 	40
<ul style="list-style-type: none"> ▪ Coordinates with other extension staff in the area, like schoolteachers and agriculture and forestry staff through regular meetings and interactions at the personal level. 	10
<ul style="list-style-type: none"> ▪ Maintains records of all BHU activities carried out at the BHU level. 	10
<ul style="list-style-type: none"> ▪ Helps to plan and implement health programs in the community to improve the health of the individual, family, and community. 	10
<ul style="list-style-type: none"> • Implements community health programs like water and sanitation, nutrition, communicable disease control, etc. by involving 	10

community leaders and organizations like Geog Yargay Tshogchhung (Geographic Development Committee) (GYT) and village meetings.	
▪ Supervises subordinate BHU staff and their programs and activities through field visits.	10
▪ Trains Village Health Workers and other community members.	05
▪ Compiles BHU reports.	05

3. KNOWLEDGE AND SKILLS REQUIREMENTS (Minimum requirements for performance of work described (Level of Education, Knowledge, Skill, and Ability):

3.1 Education: **Class 12 with 2 years Diploma in Health Sciences and Midwifery from the Royal Institute of Health Sciences (RIHS).**

3.2 Training: **Training in programs.**

3.3 Length and type of practical experience required: **Should have worked as an HA II for a minimum of 4 years or equivalent experience.**

3.4 Knowledge of languages and other specialized requirement

- Dzongkha, English, and other regional languages of Bhutan
- Commitment to and aptitude for serving people in remote areas

4. COMPLEXITY OF WORK (*Describe the intricacy of tasks, steps, processes, or methods involved in work, and difficulty and originality involved in work*):

The work involves independent decision-making in provision of health care to the population in the BHU area. S/he also requires abilities and positive attitude as a team member of the BHU. S/he should be able to recognize and correct errors and defects that may occur in the routine work of the team members in the BHU. Work requires conducting community surveys to establish relationships of common health problems in the community with their lifestyles and other predisposing factors.

5. SCOPE AND EFFECT OF WORK (*Describe the breadth of work performance, and the effect the work has on the work of others or the functions of the organization*):

This is a mid-level paramedical position requiring thorough knowledge, skills, and abilities to plan, organize, implement, monitor, supervise, and evaluate health activities in the BHU area. The work affects the work of health professionals for the reduction in morbidity and mortality and control and prevention of diseases in the population.

The work involves provision of safe medical care, planning and implementation of community health programs and activities, investigation of disease outbreaks, and initiating intervention to control the diseases. The work also involves prevention of diseases through immunization programs and promotion of health through health education.

There is constant interaction and coordination with the individual, family and community, other service sectors and Dzongkhag officials.

6. INSTRUCTIONS AND GUIDELINES AVAILABLE:

6.1 Instructions (*Describe controls exercised over the work by the superior; how work is assigned, reviewed, and evaluated*):

The work is carried out independently based on the annual work plan. The Senior HA monitors the implementation and provides guidance and support if required. The work is reviewed and evaluated during BHU meetings and reports.

6.2 Guidelines (*Indicate which written or unwritten guidelines are available, and the extent to which the employees may interpret, adapt, or devise new guidelines*):

- Standard Treatment Guide and Bhutan National Formulary
- Essential Drug list
- Five-year Plan documents and Program Manuals and Guidelines
- IEC materials

7. WORK RELATIONSHIPS (*Indicate the frequency, nature, and purpose of contacts with others within and outside the assigned organization (other than contacts with superiors)*):

This position works closely with the community leaders and other sector heads in the area. S/he keeps Senior HA informed of any problems in carrying out the activities. Other BHU staff work with her or him as team members in providing primary health care.

8. SUPERVISION OVER OTHERS (*Describe responsibility this position has for supervision of other employees, including the nature of supervisory responsibilities and categories and number of subordinates, both directly and indirectly supervised*):

This position supervises the work of Basic Health Worker and Caretakers in the BHU. S/he also supervises the works of Village Health Workers and Water Caretakers in the BHU area.

9. JOB ENVIRONMENT (*Describe physical demands required, such as walking, standing, lifting heavy objects, etc., and/or any risks or discomforts like exposure to hazards ,such as exposure to chemicals, infections, radiation, extreme weather, and other hostile working conditions*):

The job of Health Assistant demands unlimited time and is exposed to physical and mental exertion and hazards necessitating long and odd working hours, walking in difficult terrain and weather conditions, and faces the risk of wild animals and rivers. It also demands waking up at odd times of the night when there is an emergency call. The job also involves physical and verbal abuse by the attendants of the patients.

Due to inadequate health workers, one is on 24 hours duty-calls, leaving less time for rest and family matters. In the process of performing the job, s/he has a risk of getting diseases like HIV, TB, hepatitis B, etc. –

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As Bhutan has progressed financially, its health indicators have also progressed. It has achieved significant gains in all the Millennium Development Goals (MDGs). Yet two major indicators of significant undernutrition remain persistently elevated: stunting of children younger than 5, and anemia in women and children. Some factors can be interpreted as direct or nutrition-specific determinants of undernutrition in Bhutan, among them diarrheal diseases, high parasite loads in parts of the country, and a very high prevalence of *Helicobacter pylori* infections. Other, more indirect, factors can be considered nutrition-sensitive, such as diseases related to environmental and personal hygiene. The most important causes of stunting are indirect and nutrition-sensitive: poor nutrition and care of women before and during pregnancy as reflected in the profound female anemia rates. Communities are not aware of the nutrition problems of stunting and anemia and have no understanding of their causes, their significance, and what could be done to remediate them; and there are few people knowledgeable about public nutrition that have the skills needed to educate and motivate changes in community behavior. This report highlights four major public nutrition problem areas, and to focus government actions, suggests five priorities from the sector-specific recommendations considered most feasible and which would lead to immediate gains in reducing undernutrition—gains that could then draw attention and support to the problem of undernutrition in Bhutan.

ABOUT THIS SERIES:

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