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Reducing Malnutrition in Zambia: Summary of Estimates to Support Nutrition Advocacy

ZAMBIA NUTRITION PROFILES 2017

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Background

Why Invest in Nutrition, and Why Now?

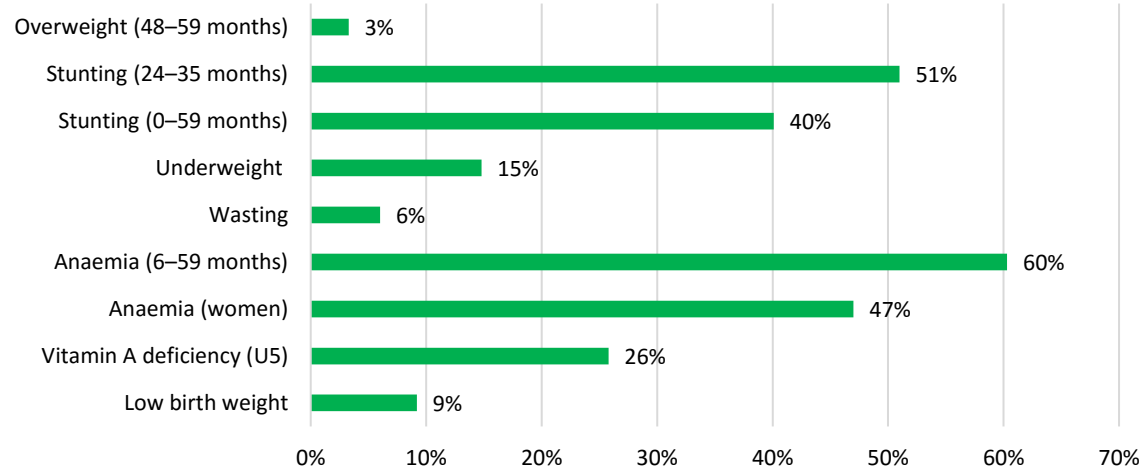
Nutrition is one of the foundations of human health and development. Good nutrition plays an important role in people's health and wellbeing; conversely, poor nutrition can lead to poor health as well as impaired physical and mental development (WHO 2014b). Malnutrition leads to reduced immunity, impairing an individual's ability to fight and recover from illness. At the same time, repeated infections can lead to malnutrition.

The impact of the malnutrition-infection cycle on the immune system is particularly important in countries like Zambia, where HIV prevalence is high; 13 percent of adults in Zambia (15 percent of women and 11 percent of men) are HIV positive (CSO et al. 2014). The high prevalence of HIV among women not only compounds the risk of HIV transmission to their children, but also increases their risk of death. Without antiretroviral therapy (ART), 50 percent of HIV-positive children will die by their second birthday (WHO and UNAIDS 2015). Zambia has low coverage of paediatric ART, reaching only 33 percent of at-risk children (UNAIDS 2014). Providing mothers and children with nutrition services is a gateway to HIV prevention, care, and treatment because nutrition screening and assessment can identify malnourished people, who are often more vulnerable to being HIV positive, and refer malnourished people whose HIV status is unknown for counseling and testing. Nutrition counseling can also promote early ART and encourage treatment adherence and retention. Therefore, investing in nutrition services and reducing malnutrition in Zambia not only will help to improve the nutrition situation in the country, but also can significantly improve the HIV situation. Together, malnutrition and HIV are major causes of childhood illness and mortality in Zambia (World Bank 2006; Black et al. 2013). Addressing both high levels of malnutrition and preventing/treating HIV will help to significantly reduce child mortality in Zambia and improve the health, well-being, and economic productivity of its citizens.

Nutrition Challenges in Zambia

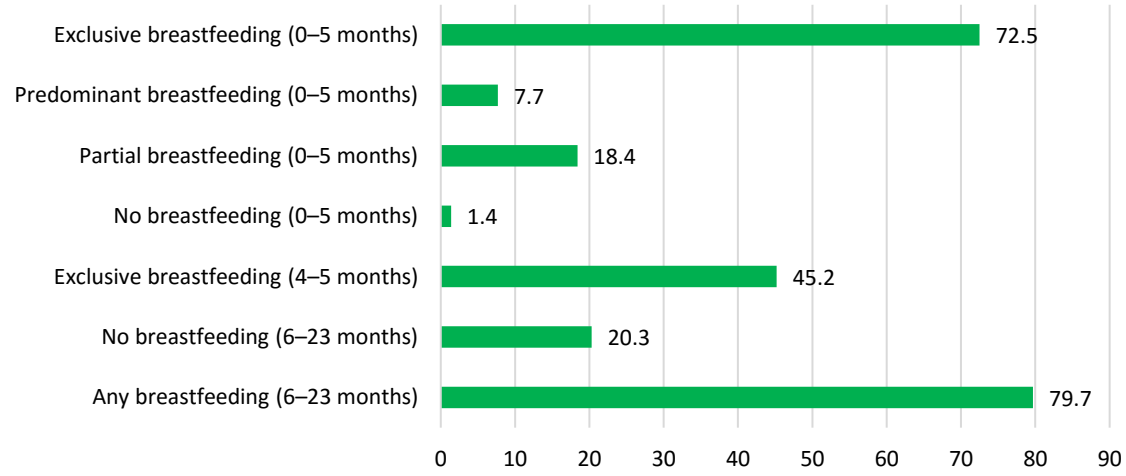
Figures 1, 2, and 3 show that Zambia still has numerous nutrition challenges, including a high prevalence of stunting and anaemia and suboptimal infant and young child feeding (IYCF) practices.

Figure 1. Malnutrition Rates in Zambia (%)



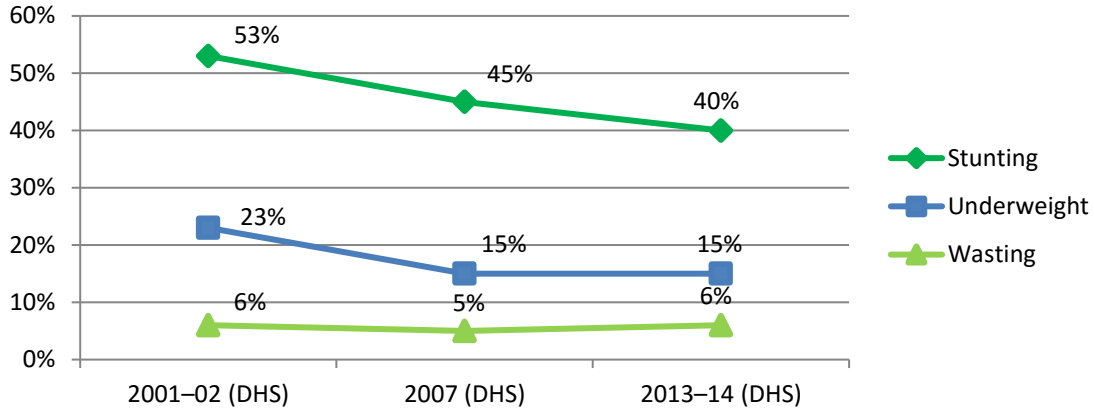
Sources: CSO Zambia et al. 2014; Government of the Republic of Zambia, Ministry of Health 2015; Zambia National Food and Nutrition Commission 2014.

Figure 2. Breastfeeding Indicators in Zambia (%)



Source: CSO Zambia et al. 2014.

Figure 3. Trends in Malnutrition in Zambia, 2001–2014 (%)



Note: The values in the graph indicate the percentage of children with z-scores < −2 (ZDHS 2013–14). For comparison, the 2001–02 anthropometric indicators were re-analyzed using the 2006 WHO Child Growth Standards to match the 2007 and 2013–14 indicators.
Sources: CSO, MOH and ICF International 2014; CSO et al. 2009; CSO, CBOH and ORC Macro 2003. The source for ZDHS 2001–02 with additional analysis is the WHO Global Database on Child Growth and Malnutrition (WHO 2014a).

Methods

PROFILES consists of a set of computer-based models that calculate the consequences if malnutrition does not improve over a defined time period and the benefits of improved nutrition over the same time period, including lives saved, disabilities averted, and human capital and economic productivity gains. Figure 4 shows the nutrition indicators for which PROFILES calculates estimates and their consequences.

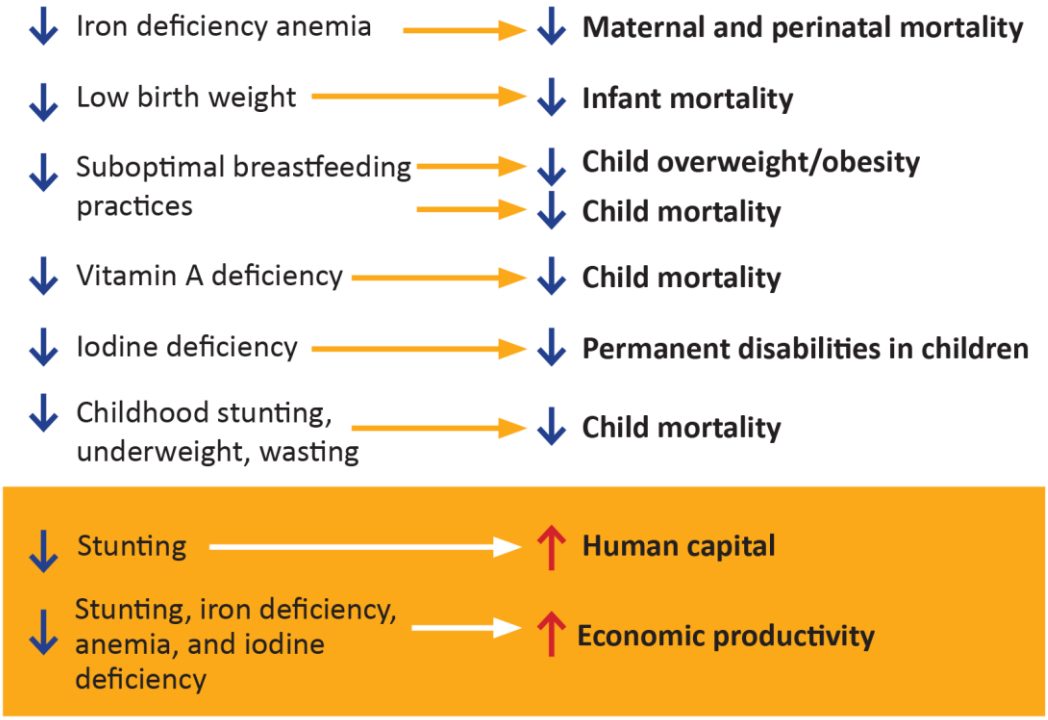
Conceptually, the basic approach in PROFILES is to compare two scenarios: a **status quo** scenario and an **improved** scenario. The status quo scenario assumes there will be no change from the current situation throughout the chosen time period (the number of years for which estimates are calculated), aside from projected changes in population size and structure. The prevalence of each nutrition problem remains the same every year in the status quo scenario. In contrast, in the improved scenario—with results estimated for the same time period—it is expected that nutrition interventions that are known to be effective are implemented at scale and succeed in reaching the stated targets in terms of improvements in the prevalence of the various nutrition problems. PROFILES then calculates the difference between the status quo scenario and improved scenario; this difference is the lives saved or deaths averted or, in terms of economic productivity, the economic gains or economic losses averted. Using these two scenarios, over a defined period of time, and based on agreed upon targets (goals for improvement in the nutrition situation), estimates are generated.

To calculate PROFILES estimates, a time period and information on nutrition, and other relevant indictors and targets are needed. Zambia Nutrition PROFILES workshop participants agreed on a 10-year time period, 2017–2026, and on the prevalence of select nutrition indicators in the country (for the status quo scenario) and targets for improvement in those nutrition indicators (for the improved scenario). These discussions required country-specific data to quantify the magnitude of the negative consequences of nutrition problems. Sources used to develop the Zambia Nutrition PROFILES 2017 estimates included the ZDHS 2013–14, 2014 Zambia Food

Consumption & Micronutrient Survey, 2015 Zambia Malaria Indicator Survey, The Education Act (Zambian Law 134), and Zambia Labour Force Survey 2014.

For Zambia Nutrition PROFILES 2017, FANTA, in collaboration with the National Food and Nutrition Commission (NFNC) and the Ministry of Health (MOH), facilitated a 4-day PROFILES workshop on 14–17 February 2017, in which 23 participants collaborated to generate preliminary PROFILES estimates. Figure 4 shows the nutrition indicators for which PROFILES calculates estimates and their consequences. These preliminary estimates were then shared with participants during a nutrition advocacy meeting on 27 February–2 March 2017. Additional details on how the estimates were generated are found in the full PROFILES report (Zambia Ministry of Health et al. 2017).

Figure 4. Nutrition Problems and Consequences Addressed in PROFILES



Note: Zambia Nutrition PROFILES 2017 did not include estimates on iodine deficiency because no recent national-level information was available for the total goitre rate (the measure of iodine deficiency used by PROFILES). Also, participants agreed that iodine deficiency was not a problem in Zambia, although they felt that advocacy was necessary to support continued iodisation of salt.

Time Period, Prevalence, and Targets Used for Zambia Nutrition PROFILES 2017 Estimates

For the purpose of the Zambia Nutrition PROFILES 2017 estimates, workshop participants chose a 10-year time period starting in 2017 and running through 2026.[1] Table 1 shows the starting prevalence used for the status quo scenario and target prevalence for each nutrition problem in PROFILES. For the improved scenario, a linear (and gradual) improvement is assumed for the time period.

[1] The time period includes 2017.

Table 1. Summary of Prevalence and Targets Used for Zambia Nutrition PROFILES 2017 Estimates

	Starting prevalence (used for status quo scenario) (%)	Target prevalence 2026 (%)
Anthropometric indicators*		
Moderate and severe underweight among children 0–59 months of age (weight-for-age z-score < −2)	14.8	9.5
Moderate and severe stunting among children 24–35 months of age (height-for-age z-score < −2)	51.0	17.3
Moderate and severe stunting among children 0–59 months of age (height-for-age z-score < −2)	40.1	20.1
Moderate and severe wasting among children 0–59 months of age (weight-for-height z-score < −2)	6.0	4.9
Overweight/obesity among children 48–59 months of age (weight-for-height z-score > +2)	3.3	<2
Vitamin A		
Population 6–59 months of age with vitamin A deficiency (including subclinical deficiency)	25.8	12.9
Anaemia (including anaemia related to iron deficiency)		
Pregnant women with anaemia (haemoglobin (Hb) < 11 g/dL)	47.0[2]	23.5
Non-pregnant women 15–49 years of age with anaemia (Hb < 12 g/dL)	47.0	23.5
Children 6-59 months of age with anaemia (Hb < 11 g/dL)	60.3	30.2
Low birth weight		
Infants weighing < 2,500 g at birth	9.2	6.2
Breastfeeding practices**		
Exclusive breastfeeding among children 0–5 months of age	72.5	90.0
Predominant*** breastfeeding among children 0–5 months of age	7.7	2.0
Partial breastfeeding among children 0–5 months of age	18.4	8.0
No breastfeeding among children 0–5 months of age	1.4	0.0
Any breastfeeding among children 6–23 months of age	79.7	90.0
No breastfeeding among children 6–23 months of age	20.3	10.0
Exclusive breastfeeding at 4–5 months of age	45.2	65.0

Sources: CSO Zambia, MOH Zambia, and ICF International 2014; Government of the Republic of Zambia, Ministry of Health 2015; Zambia National Food and Nutrition Commission 2014.

* The anthropometric indicators reflect a summary to give an indication of the information used by the PROFILES spreadsheet models.

** Breastfeeding targets included both an increase in optimal breastfeeding practices (exclusive breastfeeding 0–5 months and any breastfeeding 6–23 months) and a reduction in suboptimal breastfeeding practices (predominant, partial, or no breastfeeding for 0–5 months and no breastfeeding for 6–23 months).

*** Predominant breastfeeding refers to feeding infants 0–5 months of age breast milk as the predominant source of nourishment during the previous day. Predominant breastfeeding allows oral rehydration salts, vitamin and/or mineral supplements, ritual fluids, water and water-based drinks, and fruit juice. Other liquids, including non-human milk and food-based fluids, are not allowed, and no semi-solid or solid foods are allowed (WHO 2010). Partial breastfeeding refers to feeding infants some breast milk but also other milk, food, or food-based fluids, such as formula milk or complementary foods (complementary foods should only be given to children 6 months of age and older).

[2] Data were not available for pregnant women, so prevalence for non-pregnant women was used as a proxy.

Zambia Nutrition PROFILES 2017 Estimates

Table 2 shows the number of deaths that would result if the current nutrition situation continues in Zambia (status quo scenario), the number of deaths in the improved scenario[3] and the number of lives that would be saved over the time period if the nutrition situation improves and the targeted reductions for each nutrition problem is reached (improved scenario).

Table 2. Deaths Attributable to Various Nutrition Problems and Lives Saved Related to Improved Nutrition

Nutrition problem	2017–2026		
	DEATHS if current situation continues *Status quo scenario*	**DEATHS if nutrition situation improves** *Improved scenario*	**LIVES SAVED if nutrition situation improves** *Improved scenario*
Anthropometric indicators			
Deaths/lives saved attributable to **stunting** (severe, moderate, mild) among children < 5 years of age	156,821	112,870	43,951
Deaths/lives saved attributable to **wasting** (severe, moderate, and mild) among children < 5 years of age	81,277	67,727	13,550
Deaths/lives saved attributable to **underweight** (severe, moderate, and mild) among children < 5 years of age	107,820	85,564	22,256
Low birth weight			
Infant deaths/lives saved	48,102	41,068	7,034
Iron deficiency anaemia			
Maternal deaths/lives saved	6,521	2,726	3,795
Perinatal deaths/lives saved	27,530	11,758	15,772
Vitamin A deficiency			
Child deaths/lives saved	46,447	35,720	10,727
Breastfeeding practices			
Deaths/lives saved attributable to suboptimal breastfeeding practices among children < 2 years of age[4]	129,781	95,997	33,784

Table 3 shows the effect of suboptimal breastfeeding practices on preschool overweight/obesity. The table shows information on the number of children 48–59 months of age at risk of overweight/obesity if the current nutrition situation continues in Zambia (status quo scenario), the number of children 48–59 months of age who are likely to become overweight/obese in the improved scenario and the number of children 48–59 months of age who would be prevented from becoming overweight/obese over the time period if the nutrition situation improves and the targeted reductions for each nutrition problem is reached (improved scenario)[5].

[3] As improvements in the nutrition situation are assumed to be gradual, there will still be deaths related to the nutrition condition even in the improved scenario.

[4] For more information on how the model to generate these estimates was created see Oot et al. 2015.

[5] For more information on how the model to generate these estimates was created see Oot et al. 2016a.

Table 3. Effect of Suboptimal Breastfeeding Practices on Preschool (Children 48–59 Months of Age) Overweight/Obesity

Nutrition problem	Number of children 48–59 months of age likely to become overweight/ obese related to suboptimal breastfeeding practices *Status quo scenario* 2017–2026	Number of children 48–59 months of age prevented from becoming overweight/obese related to improved breastfeeding practices *Improved scenario* 2017–2026
Suboptimal breastfeeding related to future overweight and obesity at 48–59 months of age	30,343	5,053

Table 4 shows the human capital losses (status quo scenario) and gains (improved scenario) in terms of learning related to stunting.[6]

Table 4. Human Capital Losses and Gains in Terms of Learning

Nutrition problem	Losses in learning if the current situation continues *Status quo scenario* 2017–2016	Gains in learning if nutrition situation improves *Improved scenario* 2017–20206
Stunting	40.499 million equivalent school years of learning	9.065 million equivalent school years of learning

Table 5 shows the productivity losses related to stunting and iron deficiency anaemia that would result if the current nutrition situation continues in Zambia (status quo scenario) and the productivity gains that could be made over the time period if the stunting and anaemia situation improves and the targeted reductions are reached (improved scenario).

Table 5. Economic Productivity Losses and Gains

Nutrition problem	Economic productivity losses if the current situation continues *Status quo scenario* 2017–2026	Economic productivity gains if nutrition situation improves *Improved scenario* 2017–2026
Stunting	180,768,000,000 ZMW or 180.768 billion ZMW (US$18.315 billion)	67,792,000,000 ZMW or 67.792 billion ZMW (US$ 6.869 billion)
Iron deficiency anaemia (adult)	17,937,000,000 ZMW Or 17.937 billion ZMW (US$1.817 billion)	4,772,000,000 ZMW Or 4.772 billion ZMW (US$483 million)
Iron deficiency anaemia (child)	6,862,000,000 ZMW Or 6.862 billion ZMW (US$695 million)	1,788,000,000 ZMW Or 1.788 billion ZMW (US$181 million)

Note: Productivity gains that could result from a reduction in stunting related to improvement in the low birth weight indicator are not shown separately (they would overlap with the productivity gains associated with improvement in stunting shown here). Productivity losses/gains related to anaemia (adult) refers to adult women. Numbers in Zambian kwacha (ZMW) and US$ are rounded. The exchange rate used is 9.87 = US$1.

[6] For more information on how the model to generate these estimates was created see Oot et al. 2016b.

Figure 5 provides a summary of the status quo estimates. Figure 6 provides a summary of the improved scenario estimates.

Figure 5. Estimates of Future Lives Lost, Economic Productivity Lost, Permanent Disabilities and Human Capital Lost Associated with Various Nutrition Problems, 2017–2026

LIVES LOST		ECONOMIC PRODUCTIVITY LOST	CHILDHOOD OVERWEIGHT/ OBESITY	HUMAN CAPITAL LOST
156,821 lives of children under 5 years of age lost related to stunting	**48,102** infants' lives lost related to low birth weight	**180.768 billion ZMW** (US$18.315 billion) lost related to stunting	**30,343** children 48–59 months of age likely to become overweight/obese related to suboptimal breastfeeding practices	**40.499 million** equivalent school years of learning lost related to stunting
81,277 lives of children under 5 years of age lost related to wasting	**27,530** infants' lives lost during the perinatal period related to maternal anaemia	**17.937 billion ZMW** (US$1.817 billion) lost related to iron deficiency anaemia among adult women		
6,521 women's lives lost related to maternal anaemia	**129,781** lives of children under 2 years of age lost related to suboptimal breastfeeding practices	**6.862 billion ZMW** (US$695 million) lost related to iron deficiency anaemia in children		
46,447 lives of children under 5 years of age lost to vitamin A deficiency				

Figure 6. Estimates of Future Lives Saved, Economic Productivity Gained, Permanent Disabilities Averted and Human Capital Gained, 2017–2026

LIVES SAVED		ECONOMIC PRODUCTIVITY GAINED	CHILDHOOD OVERWEIGHT/ OBESITY PREVENTED	HUMAN CAPITAL GAINED
43,951 lives of children under 5 years of age saved related to a reduction in stunting	**7,034** infants' lives saved related to increases in birth weight	**67.792 billion ZMW** (US$6.869 billion) gained related to a reduction in stunting	**5,053** children 48–59 months of age prevented from becoming overweight/obese related to improved breastfeeding practices	**9.065 million** equivalent school years of learning gained related to a reduction in stunting
13,550 lives of children under 5 years of age saved related to a reduction in wasting	**15,772** lives saved in the perinatal period related to a reduction in maternal anaemia	**4.772 billion ZMW** (US$483 million) gained related to improvements in iron deficiency anaemia among adult women		
3,795 women's lives saved related to a reduction in maternal anaemia	**33,784** lives of children under 2 years of age saved related to improved breastfeeding practices	**1.788 billion ZMW** (US$181 million) gained related to improvements in iron deficiency anaemia among children		
10,727 lives of children under 5 years of age saved related to improvements in vitamin A status				

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