

THE COST OF HUNGER IN AFRICA

Social and Economic Impact
of Child Undernutrition in
Egypt, Ethiopia, Swaziland
and Uganda

ABRIDGED REPORT

Implications for the Social and Economic Transformation of Africa

This document is a summary of the report *The Cost of Hunger in Africa: Social and Economic Impact of Child Undernutrition in Egypt, Ethiopia, Swaziland, and Uganda*, prepared within the framework of the Memorandum of Understanding between the UN Economic Commission for Africa (ECA) and the UN World Food Programme (WFP): “The Cost of Hunger in Africa: The Economic and Social Impact of Child Undernutrition”. This initiative has been made possible by the institutional leadership provided to this project by Nkosazana Dlamini Zuma, Chairperson, AUC; Carlos Lopes, Executive Secretary, ECA; Ertharin Cousin, Executive Director, WFP. The implementation of the Agreement was **coordinated by Josué Dioné, Director of the Food Security and Sustainable Development Division (former), and Assane Diop, Director of the Social Development Policy Division at ECA, Steven Were Omamo and Abdoulaye Diop, Directors of the WFP Africa Office, Addis Ababa, and Mustapha Sidiki Kaloko, Commissioner for Social Affairs at the African Union Commission (AUC).**

The design and implementation of the study was guided by a steering committee jointly led by Dr. Ademola Olajide and Dr. Janet Byaruhanga from the Health, Nutrition and Population Division of the Social Affairs Department at the AUC; Boitshepo **Bibi Giyose from the New Partnership for Africa’s Development (NEPAD); Dr. Menghestab Haile (WFP); and Maurice Tankou (ECA).**

The technical team implementing the study at the continental level was originally led by Francisco Espejo from WFP and then by Carlos Acosta Bermudez from ECA, with the support of Rachel Quint, Yohanan Ermias and Matthias Vangenechten from WFP and Shewit Aseffa from ECA, and additional technical guidance from Rodrigo Martinez and Amalia Palma, from the Social Development Division of the Economic Commission for Latin America and the Caribbean (ECLAC). The team would like to express its gratitude to the African Taskforce for Food and Nutrition Development and the following specialists who provided on-going feedback and contributed towards the adaptation of the model: Dr. Akiko Sato and Dr. Mesfin Gebrekidan (World Health Organization), Elizabeth Eilor and Rose Aderolili (African Centre for Gender and Social Development (former), ECA), Medhat El-Helepi (Food Security and Sustainable Development Division (former), ECA), Julianne Deitch and Adrian Gauci (Economic Development and NEPAD Division (former), ECA), Mofota Griffiths Shomari (UNICEF), and Xiaoning Gong (African Centre for Statistics, ECA).

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When a child is undernourished, the negative consequences follow that child for his or her entire life. These negative consequences also have grave effects on the economies where he or she lives, learns and works.



Foreword

The time for Africa is now. As the continent experiences its most important economic expansion period in the last 30 years, it faces the challenge and the opportunity to reorient the drivers of growth towards the structural transformation required for sustained economic and social development.

The current economic growth rate on the continent is not yet sufficient to allow for change towards equity and **human development in most nations. As such, Africa's** decision-makers must continue to shift gears towards policies that focus on both short-term and medium-term results to reduce the structural barriers that constrain its social and economic development.

From an economic perspective, there is an important opportunity to shift from a commodity-driven growth strategy to a more diversified production base through industrialization of commodities and further integration of products into national and regional value chains. This shift can be a key element in providing young people with decent labour opportunities in economic activities that will also help Africa move toward a more industrialized and urbanized society that builds on **the continent's comparative** advantages.

A critical element of the social transformation agenda must focus on ensuring human capital growth through improved health, education and labour productivity. The gap in access to health services between the rural and urban population must be reduced to provide the most vulnerable populations with proper health care, and reduce child and maternal mortalities. The continent cannot afford the losses in human capital associated with poor health and its consequences to society.

Moreover, as urbanization continues to grow in the coming years, economies are likely to shift from ones based on manual labour to ones based on skilled labour. Africa, having the **world's** highest percentage of youth, with over 40 percent of the population in sub-Saharan Africa under the age of 15, stands to gain important human capital by reducing drop-out rates in schools and increasing educational levels. The continent must work to reduce the barriers that affect human development in order to maximize the benefits of this transformation.

The Cost of Hunger in Africa study demonstrates that child undernutrition can be a determinant factor in achieving

Africa's transformation agenda.

The African Union Commission and its NEPAD Planning and Coordinating Agency have partnered with the World Food Programme and the United Nations Economic Commission for Africa to analyse the crippling effects of child undernutrition. This study has been implemented in an effort to position the issue at the centre of the **continent's transformation agenda. Children and women in** Africa are faced with a series of cultural, economic and social challenges throughout their lives. This study illustrates the additional barriers faced by undernourished children in health, school performance and labour markets. These additional disadvantages limit their ability to contribute to social and economic development on the continent.

The results of the study also provide a compelling case to support the concept that human capital gain, particularly in pre-school nutrition, will help consolidate the economic expansion of Africa. The cost

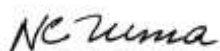
borne by Africa's economies as a consequence of food and nutritional insecurity in the past and present has hindered **the continent's full economic and social potential. The study's conclusions also call for actions directed at reducing** the current levels of child stunting and ensuring that social protection programmes address the physical and cognitive consequences that affect the school-age and working-age populations **that are currently at the centre of Africa's** development.

There is a growing consensus and understanding of the consequences of child undernutrition at the individual and community levels, specifically the losses in individual physical and cognitive capacity. Nevertheless, there is less understanding of the aggregate effect to the economy and society as a whole. The Cost of Hunger in Africa study provides policy makers with information on how economic growth is affected by undernutrition. The study also provides a picture of what the continent stands to lose if undernutrition is not addressed.

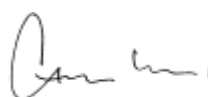
The Cost of Hunger in Africa study provides policy makers with information on how economic growth is affected by undernutrition. The study also provides a picture of what the continent stands to lose if undernutrition is not addressed.

As conclusions are drawn from this study, it must be made clear that reducing stunting alone will not be sufficient to ignite sustainable growth on the continent. However, a reduction of stunting would be an indication that social policies are taking a significant step forward, as well as being evidence that social protection mechanisms effectively reach the most vulnerable. It is clear that alongside a reduction in the number of undernourished children, increased investments in education, innovation

and technology must be made to complete the gains in human capital, and opportunities in the labour market must be created. Nevertheless, a healthy childhood is an important, and sometimes vital, precondition to this development, and as such, addressing stunting would be a first and crucial investment to build the foundation of the economic and social transformation of Africa.



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10 Findings from the First Phase of the Cost of Hunger in Africa Study*

- 1 Today, there are more stunted children in Africa than there were 20 years ago.
- 2 69 to 82 percent of all cases of child undernutrition are not properly treated.
- 3 Most of the health costs associated with undernutrition occur before the child turns one year old.
- 4 Between 7 percent to 16 percent of repetitions in school are associated with stunting.
- 5 Stunted children achieve 0.2 years to 1.2 years less in school education.
- 6 8 to 28 percent of all child mortality is associated with undernutrition.
- 7 Child mortality associated with undernutrition has reduced national workforces by 1 percent to 8 percent.
- 8 40 to 67 percent of working-age populations suffered from stunting as children.
- 9 The annual costs associated with child undernutrition reach values equivalent to 1.9 to 16.5 percent of gross domestic product (GDP).
- 10 Eliminating stunting in Africa is a necessary step for inclusive development on the continent.

* Based on results from four first-phase countries

About the Study

The Cost of Hunger in Africa (COHA) Study is a project led by the African Union **Commission (AUC) and the New Partnership of Africa’s Development (NEPAD) Planning and Coordinating Agency** and supported by the UN Economic Commission for Africa (ECA), and the UN World Food Programme (WFP). COHA is a multi-country study aimed at estimating the economic and social impacts of child undernutrition in Africa.

This continent-wide initiative is being led by the African Union Commission Department of Social Affairs, within the framework of the Revised African Regional Nutrition Strategy (2005-2015), the objectives of the African Task Force on **Food and Nutrition Development (ATFFND) and the principles of pillar 3 of the AU/NEPAD’s Comprehensive Africa Agriculture Development Programme (CAADP).**




In March 2012, the COHA Study was presented to African Ministers of Finance, Planning and Economic Development, who met in Addis Ababa, Ethiopia. The ministers issued Resolution 898 confirming the importance of the study and recommending it continue beyond the initial stage.

The core implementers of the study are national teams set up in each participating country, which are drawn from relevant governmental institutions, such as the Ministries of Health, Education, Social Development, Planning and Finance, and the national statistics institutes.

The COHA study is being carried out in 12 countries, namely Botswana, Burkina Faso, Cameroon, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mauritania, Rwanda, Swaziland and Uganda. The data in this document are the results collected from the COHA initiative in the four first-phase countries, Egypt, Ethiopia, Swaziland and Uganda.

Conceptual Framework

The COHA model is used to estimate the additional cases of morbidities, mortalities, school repetitions, school dropouts and reduced physical capacity that can be directly **associated to a person’s undernutrition before the age of 5.**

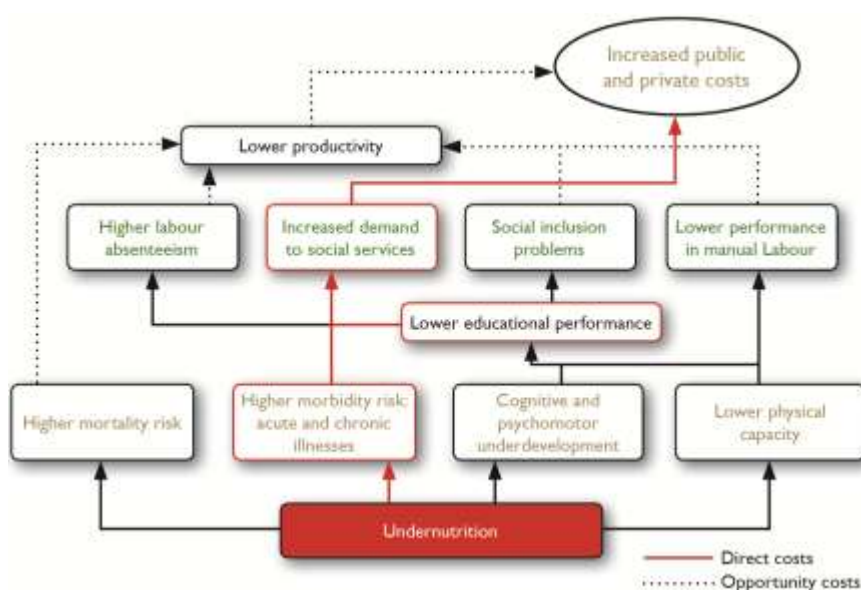
 0-5 years	Undernourished children are at higher risk of anaemia, diarrhoea, fever and respiratory infections. These additional cases of illness are costly to the health system and to families. Undernourished children are at a higher risk of dying.	<p>In order to estimate social impacts for a single year, the model focused on the current population, identified the proportion of that population that was undernourished before the age of 5 and then estimated the associated negative impacts experienced by the population in the current year.</p> <p>Estimates on health, education and productivity are based on the concept of the relative (or differential) risk experienced by individuals who suffer from undernutrition.</p> <p>Using these risk factor, alongside economic, demographic, nutritional, health and educational data provided by each country team, the model then estimates the associated economic losses incurred by the economy in health, education and potential productivity in a single year.</p>
 6-18 years	Stunted children are at a higher risk of repeating grades in school and dropping out of school. Grade repetitions are costly to the education system and to families.	
 15-64 years	If a child has dropped out of school early and has entered the workforce, he or she may be less productive, particularly in the non-manual labour market. If engaged in manual labour, he or she is likely to have reduced physical capacity and will tend to be less productive. People who are absent from the workforce as a result of undernutrition-related child mortality represent lost economic productivity.	

A Methodology for Africa

With the support of experts and representatives from the National Implementation Teams (NITs) of the participating countries, a conceptual framework was adapted to the context of Africa. This framework establishes clear linkages between direct consequences associated with undernutrition, taking into account the particular structures of the labour market on the continent, as well as the limitations in available data. The result allows the model to clearly define boundaries in the cost analysis, both from a public and individual perspective, as well as define a clear differentiation between direct cost and opportunity costs in the results.

The COHA model utilizes a two-dimensional analysis to estimate the costs arising from the consequences of child undernutrition in health, education and productivity. The incidental retrospective dimension analyses the history of child undernutrition in the country in order to estimate the current economic and social consequences. To complement this analysis, a prospective dimension is used to project and generate scenarios for analysis.

COHA is based on a model originally developed in Latin America by the Economic Commission for Latin America and the Caribbean (ECLAC). With support from ECLAC and the African Task Force for Food and Nutrition Security, the model has been adapted for use on the African continent.



Modified from Rodrigo Martínez and Andrés Fernández, *Model for analysing the social and economic impact of child undernutrition in Latin America*, based on consultations carried out by authors.

Key Terms and Concepts

Chronic Hunger: The status of people whose food intake regularly provides less than their minimum energy requirements leading to undernutrition.

Child Undernutrition: The result of prolonged low levels of food intake (hunger) and/or low absorption of food consumed. It is generally applied to energy or protein deficiency, but it may also relate to vitamin and mineral deficiencies. Anthropometric measurements (stunting, underweight and wasting) are the most widely used indicators of undernutrition.

Intrauterine growth restriction (IUGR): An infant suffering from IUGR is defined as being below the 10% percentile of the recommended gender-specific birthweight for gestational age reference curves.

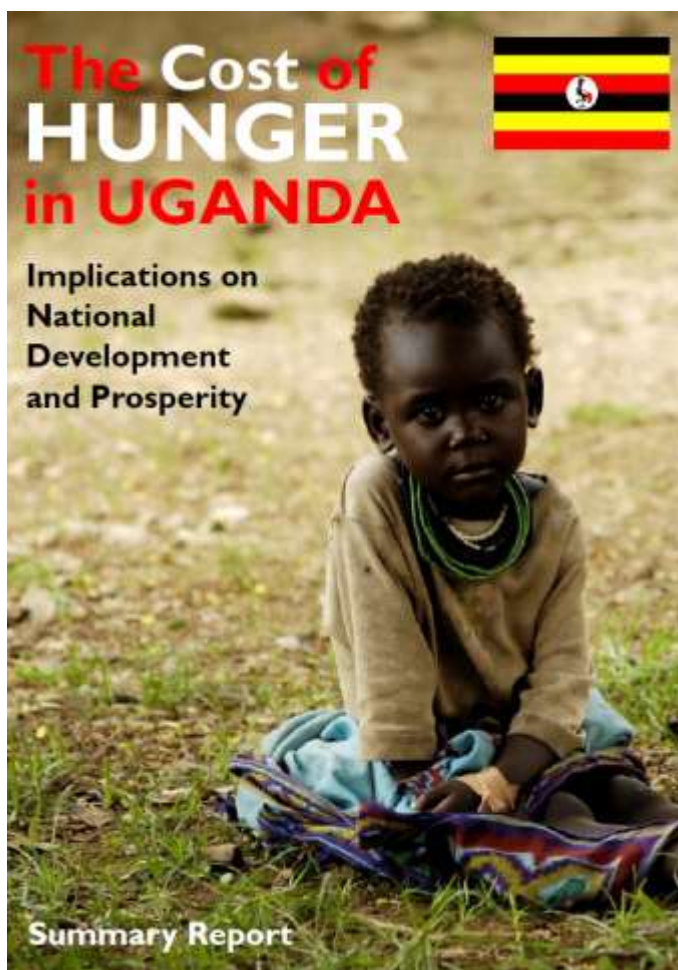
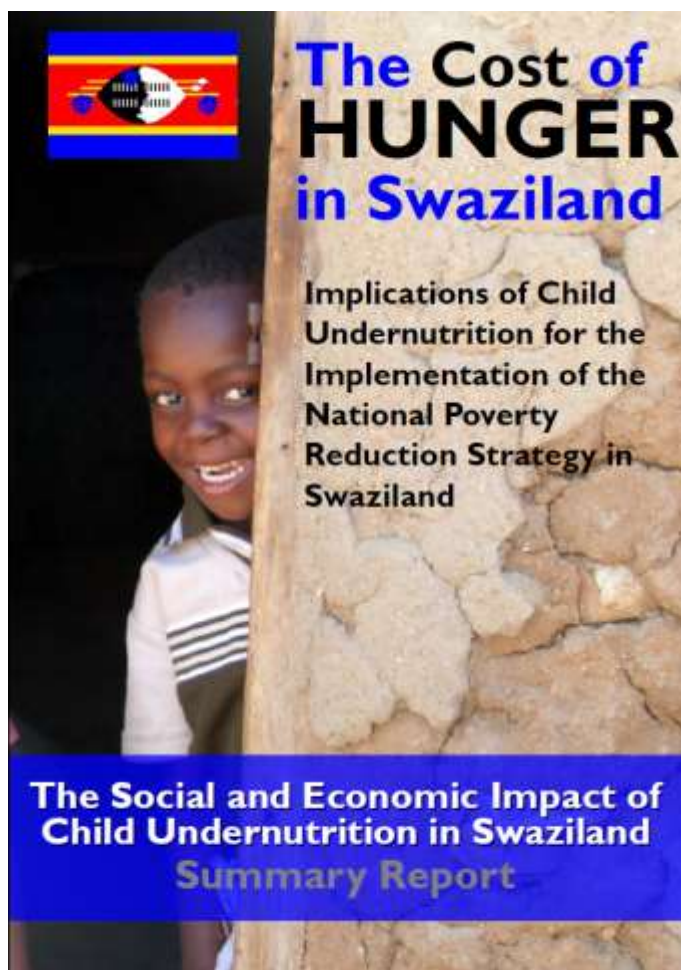
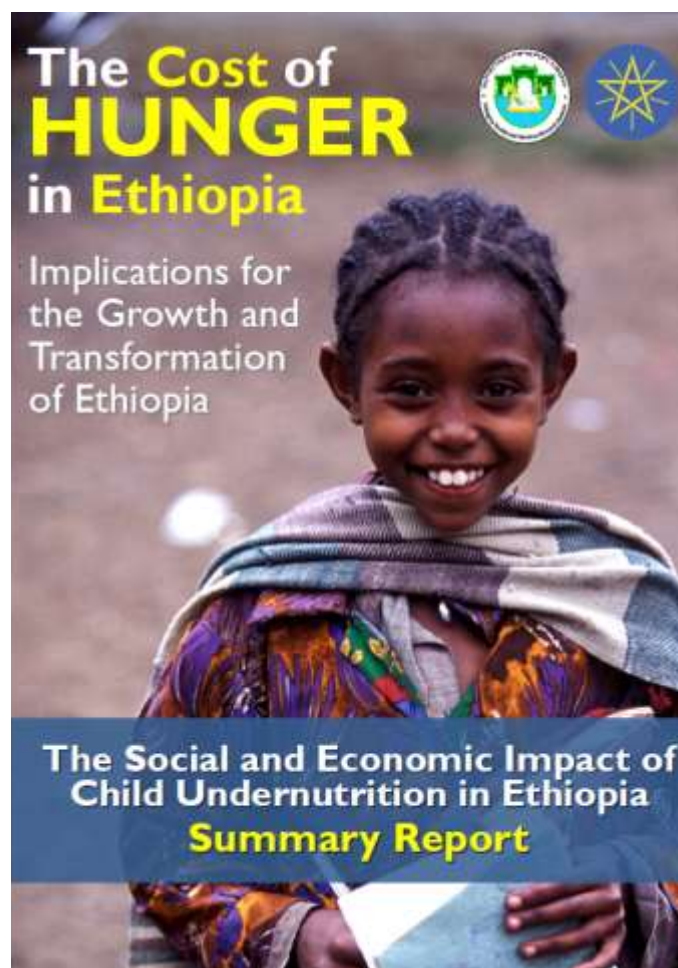
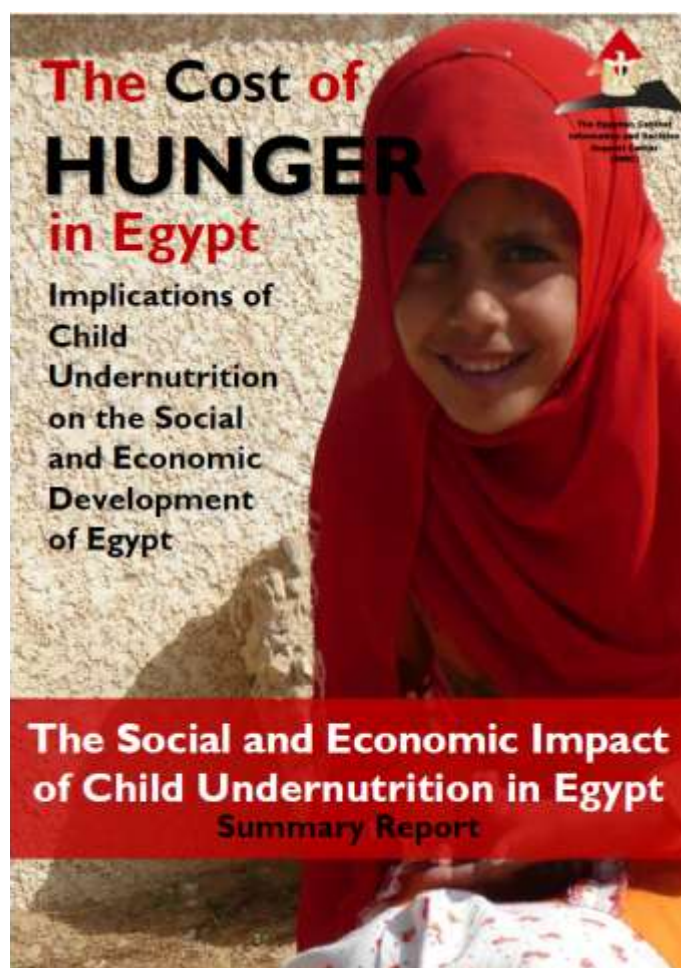
Low birth weight (LBW): A new-born is considered to have low birth weight when he or she weighs less than 2,500 grams.

Malnutrition: A broad term for a range of conditions that hinder good health caused by inadequate or unbalanced food intake or by poor absorption of the food consumed. It refers to both undernutrition (food deprivation) and obesity (excessive food intake in relation to energy requirements)

Stunting: Reflects shortness-for-age; an indicator of chronic malnutrition, calculated by comparing the height-for-age of a child with a reference population of well-nourished and healthy children. The model uses it as the indicator to analyse the impact on educational performance and productivity.

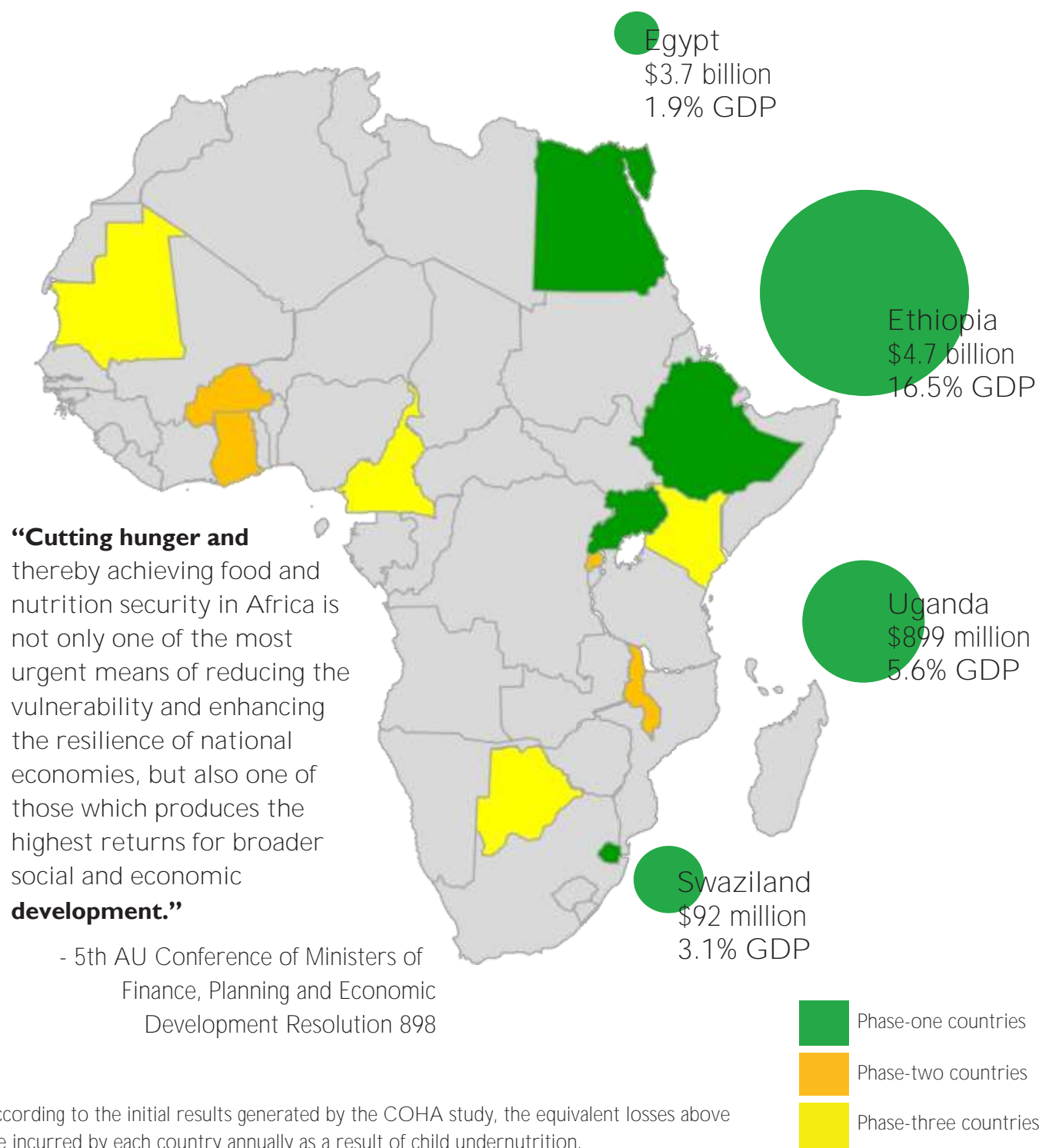
Underweight: Measured by comparing the weight-for-age of a child with a reference population of well-nourished and healthy children. The model utilizes it to analyse the impact of child undernutrition on health.





Country Results: Egypt, Ethiopia, Swaziland and Uganda

The following sections provide summaries of the results from the first-phase countries in the Cost of Hunger in Africa Study, as well as summaries of the conclusions and recommendations developed by each country's national implementation team.





Country Results: Egypt



1. Introduction

Egypt has experienced an important period of economic expansion in the last decade, with average growth rates higher than those reported for both the African continent and the North Africa region. Nevertheless, this performance has slowed in recent years due in part to political unrest. According to estimates from the African Economic Outlook,¹ the real GDP growth rates will range from 0.8 percent to 2.8 percent in the next two years.

From a nutritional perspective, Egypt has maintained low levels of underweight children for the past decade. Nevertheless, the stunting rates have increased in the same period from 20.3 percent to 28.9 percent, as reported in Demographic and Health Survey (DHS) and WHO reports.

The current levels of child undernutrition illustrate the challenges in reducing child hunger. It is estimated that 2.7 million of the 9.2 million children under the age of 5 were affected by growth retardation and 658,515 children were underweight in 2009. This situation is especially critical for children between 12 months and 24 months, where one out of every three children is affected by growth retardation.

The COHA study in Egypt is led by the Egyptian Cabinet's Information and Decision Support Center (IDSC), with support from the Central Agency for Public Mobilization and Statistics, the Ministry of Health, the Ministry of Education and the WFP Egypt Country Office.

During the process, all data for the study were collected from national data sources including the 2009 Central Agency for Public Mobilization and Statistics Household Income, Expenditure and Consumption Survey, 2009 Labour Force Survey, 2008 DHS, the African Centre for Statistics and primary data collection. The data were collected and processed with support from IDSC and the WFP Egypt Country Office.

2. Effects and Costs in Health

When a child is undernourished, he or she will have an increased chance of experiencing specific health problems. Children who are underweight are also more likely to die from illnesses related to undernutrition.

The study estimated that in Egypt in 2009, there were 901,440 incremental episodes of illness related to diseases associated with being underweight. Thirty-three percent of all episodes occurred in children less than 12 months, with more than one-third of those episodes affecting children born with low birth weight.

The treatment of undernutrition and related illnesses is a critical, recurrent cost for the health system. Treating a severely underweight child, for example, requires a comprehensive protocol that is often more costly than the monetary value and effort needed to prevent undernutrition, especially when other diseases are present in parallel. The model estimated that 51 percent of all annual costs in Egypt are incurred by children in the first year of life. These costs generate a significant important burden not just to the public sector, but to society as a whole.

Morbidity Episodes and Related Costs Associated with Undernutrition, 2009
(Costs in millions)

Pathology	Number of episodes	Cost in Egyptian Pounds (EGP)	Cost (USD)	% of episodes	% of cost
Underweight	658,516	149	27.2	72.3%	12.4%
Low birth weight (IUGR)	116,702	516	93.8	13.7%	45.2%
Anaemia	102,965	470	85.4	11.3%	39.3%
Acute diarrhoeal syndrome (ADS)	18,342	32	5.8	2.2%	2.8%
Acute respiratory infection (ARI)	4,915	3	0.5	0.6%	0.3%
Total	901,440	1,170	212.7		

Research shows that undernourished children under 5 have an increased risk of dying; among children aged 0-5 in Egypt in between 2005 and 2009, it is estimated that there were 28,102 child mortalities associated with undernutrition. These deaths represent 11 percent of all child mortalities for this period.

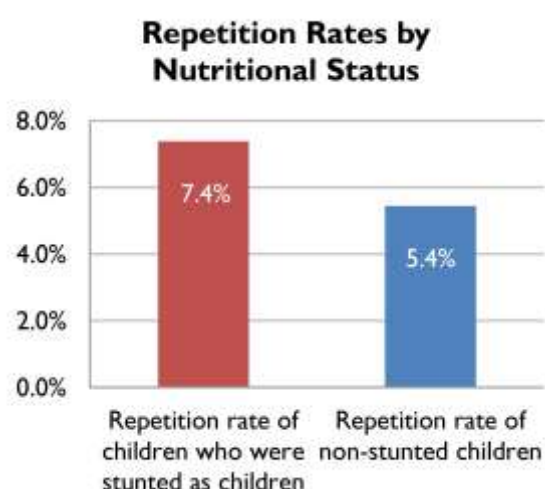
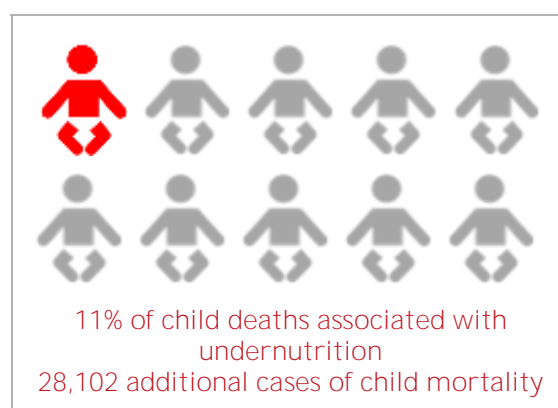
The costs associated with mortality are identified in losses to national productivity. If these children were able to reach adulthood, they could have contributed to the economy.

3. Effects and Costs in Education

There is no single cause for repetition and dropout; however, there is substantive research that shows that students who were stunted before the age of 5 are more likely to underperform in school.

Based on official information provided by the Ministry of Education, over 830,603 children repeated grades in 2009 (6 percent). Based on the increased risk of repetition among stunted students, the model estimated that the repetition rate for stunted children was 7.4 percent, while the repetition rate for non-stunted children was 5.4 percent. **Based on these rates and the proportion of stunted students, the model estimates** that 79,396 students, or 10 percent of all repetitions, in 2009 were associated with undernutrition.

These children generate an incremental cost to the education system, as they require twice as many resources, since they repeat the year. In addition, caretakers have to cater to their educational cost for an extra year.



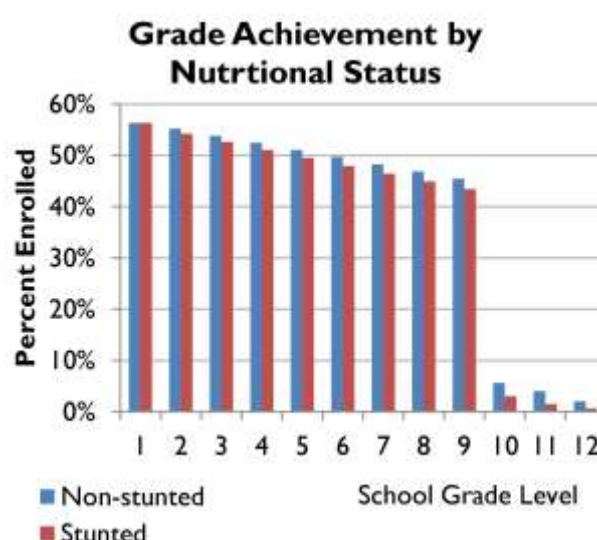
Repetitions in School and Related Costs Associated with Stunting
(Costs in millions)

	Primary	Secondary	Total Costs
Number of repetitions associated with stunting	46,762	32,634	79,396
Total public costs (EGP)	62.2	101.8	163.9
Total private costs (EGP)	62.9	43.9	106.8
Total (EGP)	125.1	145.7	270.7
Total public costs (USD)	11.3	18.5	29.8
Total private Costs (USD)	11.4	8.0	19.4
Total (USD)	22.7	26.5	49.2

Students who were stunted are also more likely to drop out of school.

According to available data and taking into account relative risks relating to the consequences of stunting on education, it can be estimated that 45 percent of non-stunted people (of working age) in Egypt completed lower secondary school, while only 43 percent of stunted people completed lower secondary school. Three percent of non-stunted people completed secondary school, while only 1 percent of stunted people did.

The costs associated with school dropouts are reflected on the productivity losses experienced by individuals searching for opportunities in the labour market. As such, the impact is not reflected in the school age population, but in the working-age population, particularly in non-manual activities.



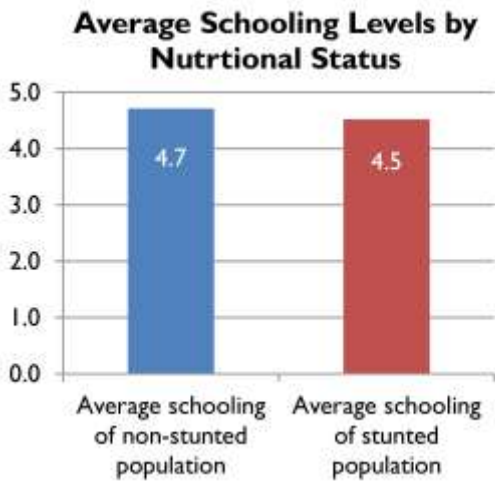
4. Effects and Costs in Productivity

The model estimated that 41 percent of the working-age population in Egypt were stunted as children. Research shows that adults who suffered from stunting as children are less productive than non-stunted workers and are less able to contribute to the economy. This represents more than 20.5 million people whose potential productivity is affected by undernutrition.

Productivity losses associated with stunting affect both workers in non-manual labour (36 percent of the labour force in Egypt) and those in manual activities (64 percent of workers).

Stunted people, on average, have achieved fewer years of schooling than non-stunted people. In non-manual activities, higher academic achievement is directly correlated with higher income. It is estimated that the educational gap between the stunted and non-stunted population is 0.2 years, and associated annual losses are EGP2.7 billion, equivalent to 0.3 percent of the GDP in 2009.

Research shows that stunted workers engaged in manual activities tend to have less lean body mass and are more likely to be less productive in manual activities than those who were never affected by growth retardation. The model estimated that 33.5 million Egyptians are engaged in manual activities, of whom 13.7 million were stunted as children. This represented an annual loss that surpasses EGP10.7 billion, equivalent to 1.03 percent of the GDP in potential income lost due to lower productivity.



Productivity Losses Associated with Stunting
(Costs in millions)

Age group in 2009	Population in non-manual labour who were stunted (thousands)	Loss in productivity in non-manual activities (EGP)	Loss in productivity in non-manual activities (USD)	Population in manual labour who were stunted (thousands)	Loss in productivity in manual activities (EGP)	Loss in productivity in manual activities (USD)
15-24	1,354	684.5	124.5	5,791	4,793	872
25-34	1,947	1,003	182.4	2,928	2,719	494
35-44	1,674	715.3	130.0	2,128	1,594	290
45-54	1,483	230.0	41.9	1,481	964	175
55-64	724	26	4.7	1,372	662	120
Total	7,182	2,659	483.5	13,701	10,732	1,951
% GDP		0.3%			1.03%	



Undernutrition-related mortalities contribute to losses in potential national productivity. The model estimated that **352,813 people of working age are absent from Egypt's workforce in 2009** due to child mortality associated with undernutrition. This represents a 1 percent reduction in the current workforce.

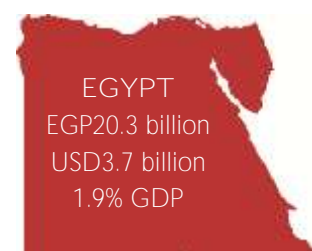
Considering the productive levels of the population, by their age and sector of labour, the model estimated that in 2009, the economic losses (measured by working hours lost due to undernutrition-related child mortality) were EGP5.4 billion, which represented **0.52 percent of the country's GDP**.

Productivity Losses Due to Mortality Associated with Undernutrition
(All values in millions)

Age group in 2009	Working hours lost	Loss in productivity (EGP)	Loss in productivity (USD)
15-24	317	2,250	409
25-34	202	1,441	262
35-44	159	899	163
45-54	107	572	104
55-64	71	274	50
Total	857	5,436	988
% GDP		0.52%	

5. Summary of Costs

For Egypt, the total losses associated with undernutrition are estimated at EGP20.3 billion (USD3.7 billion) for the year 2009. These losses are equivalent to 1.9 percent of GDP of that year. The largest portion of this cost is the loss associated with stunting in potential productivity in manual activities.



6. Analysis of Scenarios

The model can generate a baseline for various scenarios, based on nutritional goals established in each country. Scenarios, which were agreed upon with the national implementation team in Egypt, can then be used to advocate for increased investments in proven nutritional interventions.

Scenarios are constructed based on the estimated net present value of the costs of the children born in each year from 2009 to 2025. While the previous section calculated the costs incurred in a single year by historical trends of undernutrition, these costs represent the present values and savings generated by children born between 2009 and 2025.

Scenarios Analysed

Baseline. The cost of inaction — Progress in reduction of stunting and underweight child stops

For the baseline, progress in reducing the prevalence of undernutrition stops at the level achieved in 2009. It also assumes that the population growth would maintain the pace reported in the year of the analysis, hence increasing the number of undernourished children and the estimated cost. As this scenario is highly unlikely, its main purpose is to establish a baseline to which any improvements in the nutritional situation are compared in order to determine the potential savings in economic costs.

Scenario #1: Cutting by half the prevalence of child undernutrition by 2025

In this scenario, the prevalence of underweight and stunted children would be reduced to half of the 2009 value. In the case of Egypt, this would mean a constant reduction of 0.96% points annually in the stunting rate, from 30.7 (estimate for 2009) to 15.4 percent in 2025. With the right combination of proven interventions, this scenario would be achievable, as the average rate of reduction for stunting between 2000 and 2008 is estimated at 0.76 percentage points, which is very close to the progress rate required in achieving these scenarios. Nevertheless, for the period 2005-2008, the country faced a setback in progress at a rate of -2.3 percentage points, which appears to indicate that stronger investments are required to return to a positive trend.

Scenario #2: The goal scenario — Reduce stunting to 10 percent and underweight children to 5 percent, by 2025

In this scenario, the prevalence of stunted children under 5 would be reduced to 10 percent and the prevalence of underweight children under the age of 5 to 5 percent. Currently, the global stunting rate is estimated at 26 percent, with Africa having the highest prevalence at 36 percent. This goal scenario would require a true call for action and would represent an important continental challenge for which countries of the continent could collaborate to achieve. The progress rate required to achieve this scenario would be a 1.2 percentage points annual reduction for a period of 16 years, from 2009 to 2025.

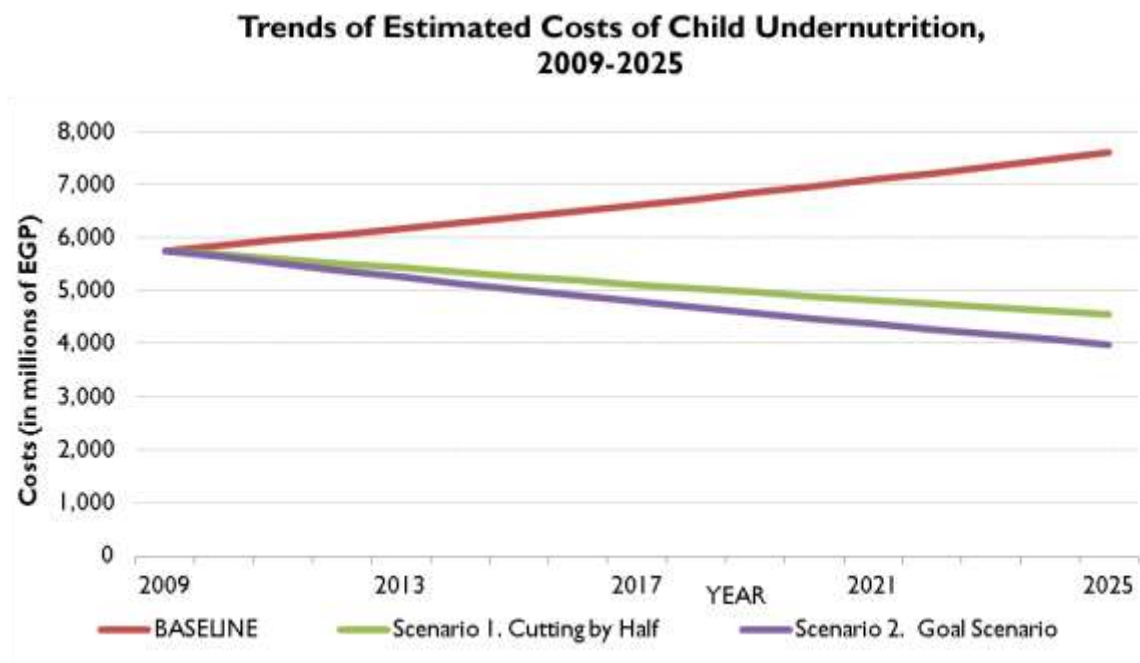
In the baseline, where progress in reducing child undernutrition would stop at the level of 2009, the cost in 2025 would reach EGP7.6 billion (USD1.4 billion).

In Scenario #1 in which a reduction to half of the current prevalence is achieved, the cost in 2025 would be reduced to EGP4.6 billion (USD828.5 million). For the full period between 2009 to 2025, this would represent a savings of EGP11.7 billion (USD2.1 billion). Although the tendency of savings would not be linear, as they would increase over time as progress was achieved, a simple average of the annual savings would represent EGP732 million (USD133 million) per year.

In the case of the goal scenario, the cost by 2025 would be reduced to EGP3.9 billion (USD726.6 million). This translates into an increase in total savings to EGP14.5 billion (USD2.6 billion), which represents USD164.9 million per year for the same 16-year period.

Costs and Savings by Scenario (All values in millions)						
	Baseline		S1. Cutting by Half		S2. Goal Scenario	
	EGP	USD	EGP	USD	EGP	USD
Projected cost in the year 2025	7,613	1,384	4,557	829	3,997	727
Total projected savings (2009-2025)	-	-	11,709	2,129	14,515	2,639
Annual projected savings (2009-2025)*	-	-	732	133	907	165
Annual percentage points reduction in stunting rates required to achieve scenario (2009-2025)	Progress stops		0.90%		1.20%	

*Simple average



7. Conclusions and Recommendations

The Cost of Hunger in Africa (COHA) study presents an opportunity to better understand the role that child nutrition can play in maximizing the economic capacity of Egypt.

In Egypt, the results of the study strongly suggest that, in order achieve the national goals of doubling the income, eliminating unemployment, and establishing a sustained annual growth rate, special attention must be given to addressing nutrition in the **early stages of an individual's life (in the first 1,000 days)**. The study estimated that child undernutrition generates health costs equivalent to EGP1.1 billion (USD203 million), and that 11% of all cases of child mortality are associated with the higher risk of undernutrition. With regards to education, the results show that 10% of all grade repetitions in school are associated with the higher incidence of repetition experienced by stunted children. The study estimated the economic and social cost of child undernutrition in 2009 at EGP20.3 billion (USD3.7 billion). Without measures to combat and eliminate undernutrition, this cost is expected to continue to increase.

Some of the key findings of the study indicate the need to review national development frameworks and develop a comprehensive and holistic national economic and health plan that includes nutrition as a key component. Further, it is recommended that nutrition interventions are mainstreamed within the primary health care system, with increased investment into institutional capacity to regularly detect, monitor and address undernutrition, and clearly link findings into prevention interventions. This requires a focus on preventative policies, as well as on therapeutic practices. In order to address some of the consequences of undernutrition, raising awareness of nutrition is critical, particularly through schools. Lastly, it is suggested that facilitating access to healthier food commodities, including through the food subsidy system, amended agricultural policies, and mandatory food fortification should be considered.

Detailed country-specific recommendations were presented at the launch of the Egypt country report on 20 June 2013 by the Chairman of the IDSC, Dr. Yasser Ali.



Country Results: Ethiopia



1. Introduction

Ethiopia has made important progress in the reduction of poverty. According to available data, the country has reduced the population living under the poverty line, from 56 percent to 30 percent in the last decade. There is also a positive outlook on **the economy. Ethiopia is one of the world's fastest growing economies, exceeding average global growth rates, as well as the averages for both Africa and Eastern Africa.**

Ethiopia has also made important progress in the reduction of child undernutrition in the last decade. According to the 2011 DHS survey, approximately 44.2 percent of Ethiopian children under 5 suffered from low height for their age (stunting), which represented an important improvement from the 50.7 percent in 2005. Additionally, the prevalence of underweight children has also improved from 34.6 percent to 28.7 percent. For that same period, the levels of low birth weight (LBW) has also improved from 14 (2005) to 11 percent (2011).

Nevertheless, the current levels of child undernutrition indicate challenges ahead in the reduction of child hunger. It is estimated that 4.3 million of the 12.1 million children under the age of 5 in 2009 are affected by growth retardation and nearly 3 million children are underweight. This situation is especially critical for children between 12 and 24 months, where half of all children in Ethiopia are affected by growth retardation.

The COHA study in Ethiopia is led by the Federal Ministry of Health, through the Ethiopian Health and Nutrition Research Institute (EHNRI), Ministry of Education, Ministry of Finance and Economic Development, Central Statistics Agency (CSA) and WFP Ethiopia.

During the process, all data for the study were collected from national data sources, including the Ethiopia Household Income, Consumption and Expenditure Survey 2010/11, CSA Databases, DHS 2011, previous DHS studies, the African Centre for Statistics and UN Population Division, as well as primary data collection.

2. Effects and Costs in Health

When a child is undernourished, he or she will have an increased chance of experiencing specific health problems. Children who are underweight are also more likely to die from illnesses related to undernutrition.

The study estimated that in Ethiopia during the year 2009, there were almost 4.4 million more episodes of illness due to disease associated with the higher vulnerability to being underweight. The highest occurrence of episodes was found in diarrhoea with 527,153 more episodes in underweight children, followed by anaemia with 365,311 annual episodes.

The treatment of undernutrition and related illnesses is a critical recurrent cost for the health system. Treating a severely underweight child, for example, requires a comprehensive protocol that is often more costly than the monetary value and effort needed to prevent undernutrition, especially when other diseases are present in parallel. These costs generate a significant burden not just to the public sector but to society as a whole.

Morbidity Episodes and Related Costs Associated with Undernutrition, 2009
(Costs in millions)

Pathology	Number of episodes	Cost in Ethiopian Birr (ETB)	Cost in USD	% of episodes	% of Cost
Underweight	2,991,509	693	58.7	68%	38%
Low birth weight (IUGR)	148,173	572	48.5	3%	31%
Anaemia	365,311	130	11.0	8%	7%
Acute diarrhoeal syndrome (ADS)	527,153	144	12.2	12%	8%
Acute respiratory infection (ARI)	114,300	61	5.2	3%	3%
Fever/Malaria	264,232	231	19.6	6%	13%
Total	4,410,678	1,831	155.2		

Research shows that undernourished children under 5 have an increased risk of dying; the model estimated that in Ethiopia nearly 1 out of every 4 reported deaths of children is associated with undernutrition. Among children aged 0-5 in the years 2005 to 2009, it is estimated that there were 378,591 child mortalities associated with undernutrition.

The costs associated with mortality are identified in losses to national productivity. If these children were able to reach adulthood, they could have contributed to the economy.

3. Effects and Costs in Education

There is no single cause for repetition and dropout; however, there is substantive research that shows that students who were stunted before the age of 5 are more likely to underperform in school.

Based on official information provided by the Ministry of Education and Training, 963,599 primary school students repeated grades in 2009 (13.9 percent). Based on the increased risk of repetition among stunted students, the model estimated that the repetition rate for stunted children was 15.1 percent, while the repetition rate for non-stunted children was estimated at 11.2 percent. Based on these rates and the proportion of stunted students, the model estimated that 152,488 repetitions, or 15.8 percent of all repetitions in 2009 were associated with undernutrition.

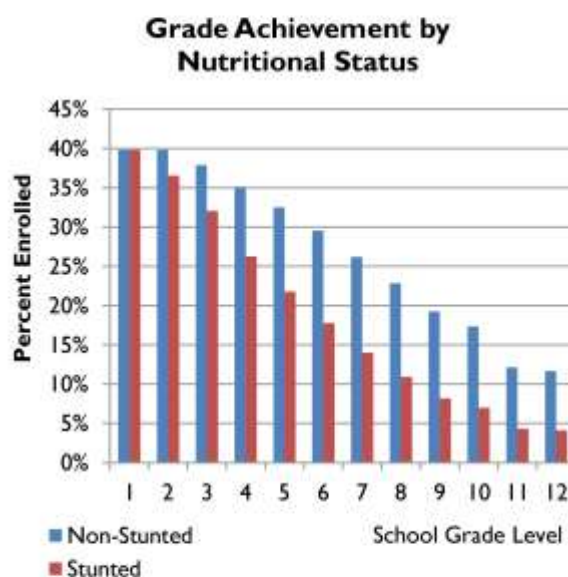
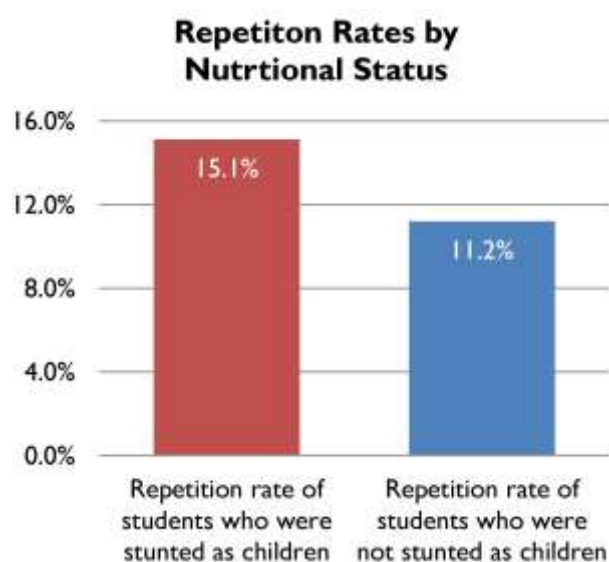
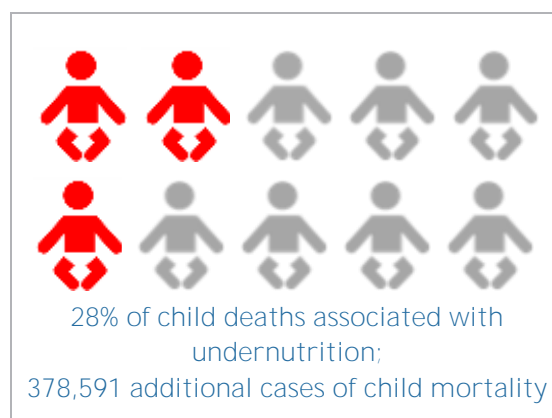
These children are currently generating an incremental cost to the education system, as they require twice as many resources, having to repeat the year. In addition, their caretakers also have to cater to their educational cost for an extra year.

Repetitions in School and
Related Costs Associated with Stunting
(Costs in millions)

Total Costs in Primary School	
Number of repetitions associated with stunting	152,488
Total public costs (ETB)	34.0
Total private costs (ETB)	59.4
Total (ETB)	93.4
Total public costs (USD)	2.9
Total private costs (USD)	5.0
Total (USD)	7.9

Students who are undernourished are also more likely to drop out of school.

According to available data and taking into account relative risks of stunting on education, it can be estimated that 23 percent of non-stunted population of working age completed primary school, compared to only 11 percent of stunted people. The costs associated with school dropouts are reflected on the productivity losses experienced by individuals searching opportunities in the labour market. As such, the impact is not reflected in the school age population, but in the working-age population, particularly in non-manual activities.



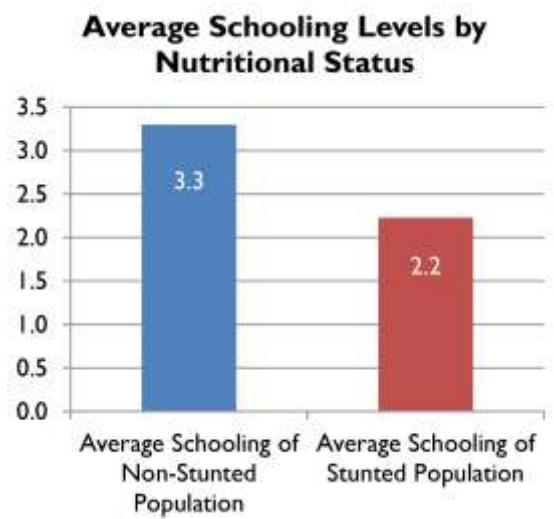
4. Effects and Costs in Productivity

The model estimated that 67 percent of the working-age population in Ethiopia were stunted as children. Research shows that adults who suffered from stunting as children are less productive than non-stunted people and are less able to contribute to the economy. This represents more than 26.1 million people in Ethiopia whose productive potential is affected by undernutrition.

Productivity losses associated with stunting affect both workers in non-manual labour (6.8 percent of the labour force in Ethiopia) as well as those in manual activities (93.2 percent of workers).

Stunted people, on average, have achieved fewer years of schooling than non-stunted people. In non-manual activities, higher academic achievement is directly correlated with higher income. It is estimated that the educational gap between the stunted and non-stunted population is 1.1 years. The estimated annual losses in income for this group, due to lower schooling, are ETB625 million, which are equivalent to 0.2 percent of the GDP in 2009.

Research shows that stunted workers engaged in manual activities tend to have less lean body mass and are more likely to be less productive in manual activities than those who were never affected by growth retardation. The model estimated that 36.1 million Ethiopians are engaged in manual activities, of whom 24.3 million were stunted as children. This represented an annual loss that surpasses ETB12.8 billion, equivalent to 3.8 percent of the GDP, in potential income lost due to lower productivity.



Productivity Losses Associated with Stunting
(Costs in millions)

Age group in 2009	Population in non-manual labour who were stunted (thousands)	Loss in productivity in non-manual activities (ETB)	Loss in productivity in non-manual activities (USD)	Population in manual labour who were stunted (thousands)	Loss in productivity in manual activities (ETB)	Loss in productivity in manual activities (USD)
15-24	868	63.3	5.4	9,053	4,251	360
25-34	561	212.2	18.0	6,062	3,455	293
35-44	293	207.5	17.6	4,307	2,508	213
45-54	163	134.8	11.4	2,867	1,612	137
55-64	54	7.5	0.6	1,984	1,030	87
Total	1,939	625.3	53.0	24,273	12,856	1,090
% GDP		0.20%			3.80%	



Undernutrition-related mortalities contribute to losses in potential national productivity. The model estimated that 3.2 million people of working age are absent from the workforce in 2009 due to child mortality associated with undernutrition. This represents a 8 percent reduction in the current workforce.

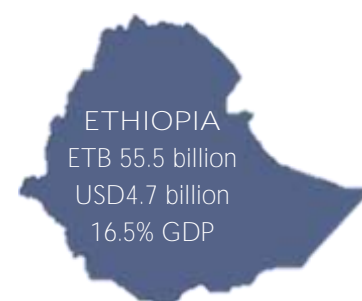
Considering the productive levels of the population, by their age and sector of labour, the model estimated that in 2009, the economic losses (measured by working hours lost due to undernutrition-related child mortality) are ETB 40 billion, which represented 11.9 percent of the country's GDP for 2009.

Productivity Losses due to Mortality
Associated with Undernutrition
(All values in millions)

Age group in 2009	Working hours lost	Loss in productivity (ETB)	Loss in productivity (USD)
15-24	1,198	9,238	783
25-34	1,117	9,516	806
35-44	917	8,039	681
45-54	776	6,767	573
55-64	778	6,510	552
Total	4,786	40,070	3,395
% GDP		11.90%	

5. Summary of Costs

For Ethiopia, the total losses associated with undernutrition are estimated at ETB55.5 billion (USD4.7 billion) for the year 2009. These losses are equivalent to 16.5 percent of GDP of that year. The highest element in these costs relates to the lost working hours due to mortality associated with undernutrition.



6. Analysis of Scenarios

The model can generate a baseline for various scenarios, based on nutritional goals established in each country. Scenarios are constructed based on the estimated costs of the children born in each year, from 2009 to 2025 (net present value). While the previous section calculated the costs incurred in a single year by historical trends of undernutrition, these costs represent the present values and savings generated by children born between 2009 to 2025.

Scenarios Analysed

Baseline. The cost of inaction — Progress in reduction of stunting and underweight child stops

For the baseline, the progress of reduction of the prevalence of undernutrition stops at the levels achieved in 2009. It also assumes that the population growth would maintain the pace reported in the year of the analysis, hence increasing the number of undernourished children and the estimated cost. As this scenario is highly unlikely, its main purpose is to establish a baseline, to which any improvements in the nutritional situation are compared in order to determine the potential savings in economic costs.

Scenario #1. Cutting by half the prevalence of child undernutrition by 2025

In this scenario, the prevalence of underweight and stunted children would be reduced to half of the 2009 values corresponding to the reference year. In the case of Ethiopia this would mean a constant reduction of 1.5 percent age points annually in the stunting rate, from 46.4 percent (estimate for 2009) to 23.2 percent in 2025. With the right combination of proven interventions, this scenario would be achievable, as the rate of reduction for stunting between 2001 and 2011 is estimated at 1.1 percentage points, which is close to the progress rate required in achieving this scenario.

Scenario #2. The goal scenario — Reduce stunting to 10 percent and underweight children to 5 percent, by 2025

In this scenario, the prevalence of stunted children would be reduced to 10 percent and the prevalence of underweight children under the age of 5 to 5 percent. Currently, the global stunting rate is estimated at 26 percent, with Africa having the highest prevalence at 36 percent. This Goal Scenario would require a true call to action, and would represent an important continental challenge in which countries on the continent could collaborate jointly in its achievement. The progress rate required to achieve this scenario would be a 2.3 percentage points annual reduction for a period of 16 years, from 2009 to 2025.

In the baseline, where progress in reducing child undernutrition would stop at the level of 2009, the cost in 2025 would reach ETB 43.4 billion (USD3.7 billion).

In Scenario #1 in which a reduction of half of the current prevalence is achieved, the cost in 2025 would reduce to ETB24.4 billion (USD2.1 billion). For the full period between 2009 to 2025, this would represent a total savings of ETB70.9 billion (USD6.0 billion). Although the tendency of savings would not be linear, as they would increase over time as progress was achieved, a simple average of the annual savings would represent ETB4.4 billion (USD375.6 million) per year.

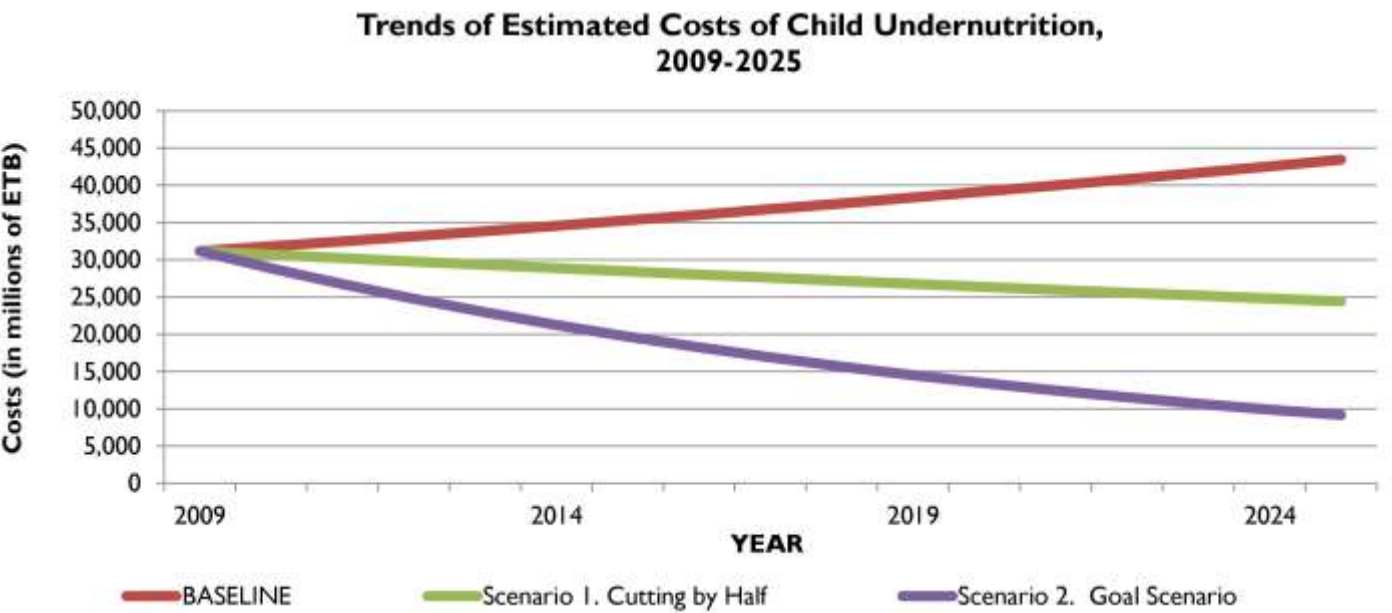
In the case of the goal scenario, the cost in 2025 would be reduced to ETB9.2 billion (USD777.2 million). This translates into an increase in total savings to ETB148.0 billion (USD12.5 billion), which represents ETB 9.3 billion (USD784.0 million) per year, for the same 16-year period.

In addition to the scenarios presented, an additional analysis has been carried out for Ethiopia. The National Nutrition Plan has established a target of achieving 30 percent stunting by the year 2015. If this target were to be achieved, the model estimated that the annual average savings of this scenario would be an average of USD106 million, and would require a progress of 2.7 percent annually from the values estimated for 2009.

Costs and Savings by Scenario
(All values in millions)

	Baseline		S1. Cutting by Half		S2. Goal Scenario	
	ETB	USD	ETB	USD	ETB	USD
Projected cost in the year 2025	43,445.1	3,681.8	24,436.2	2,070.9	9,170.8	777.2
Total projected savings (2009-2025)	-	-	70,918.3	6,010.0	148,023.3	12,544.3
Annual projected savings (2009-2025)*	-	-	4,432.4	375.6	9,251.5	784.0
Annual percentage points reduction in stunting rates required to achieve scenario (2009-2025)	Progress stops		1.5%		2.3%	

*Simple average



7. Conclusions and Recommendations

The Cost of Hunger in Africa (COHA) Study presents an opportunity to better understand the role that child nutrition can play as a catalyst for social and economic transformation, and human development.

In Ethiopia, the results of the study strongly suggest that, in order to achieve inclusive economic growth and human development, special attention must be given to addressing nutrition in the early stages of an individual's life. The study estimates that child undernutrition generates health costs equivalent to 0.5% of the total public budget allocated to health and that only three out of every 10 children are estimated to be receiving proper health attention. The study further demonstrates that 28 percent of all cases of child mortality are associated with the higher risk of undernutrition. With regards to education, the results show that 15.8 percent of all grade repetitions in school are associated to the higher incidence of repetition experienced by stunted children.

Some of the key findings of the study indicate the need for scaling-up current interventions and developing innovative solutions to fight child undernutrition in Ethiopia. Going forward, it is recommended that the Government of Ethiopia promotes access to, and the utilization of, nutrition-sensitive health services; scales up complementary feeding practices and local food processing; explores further opportunities in bio-fortification; sets aggressive targets for the reduction of stunting; delivers nutrition services to adolescents; and addresses bottlenecks in policy and practice that undermine the efficiency of existing nutrition interventions.

Detailed country-specific recommendations were presented at the launch of the Ethiopia country report on 24 June 2013 by EHNRI. The report was officially endorsed by Dr. Kebede Worku, State Minister of Health, and Dr. Amha Kebede, Director-General of EHNRI.



Country Results: Swaziland



1. Introduction

Swaziland currently faces important development challenges, particularly associated with income inequality, unemployment, food insecurity and elevated levels of HIV prevalence amongst the population. In recent years, there have been positive signs of poverty reduction. According to national surveys, the population living under the poverty line has dropped from 69 to 63 percent, with an estimated 40.6 percent of people living with under USD1.25 a day.

In the 1980s, Swaziland had one of the fastest growing economies in Africa. However, this dynamic has slowed down in recent years. **In 2011, the country faced an important fiscal crisis that affected the country's growth and development. This crisis,** paired with the possibility of rising food prices in the future, makes the economy vulnerable to inflation.

The current levels of child undernutrition indicate the challenges lying ahead in the reduction of child hunger. It is estimated that 45,926 of the 156,418 children under the age of 5 in Swaziland were affected by growth retardation in 2009 and nearly 10,000 were underweight. This situation is especially critical for children between 12 and 24 months, where one out of every three children is affected by growth retardation.

The COHA study in Swaziland is led by the National Children's Coordination Unit in the Office of the Deputy Prime Minister, with support from the Ministry of Health, Ministry of Agriculture, Ministry of Education, Ministry of Finance, Swaziland National Nutrition Council, University of Swaziland and the WFP Swaziland.

During the process, all data for the study were collected from national data sources, including the Swaziland Labour Force Survey 2007, Demographic and Health Survey 2008 and previous DHS studies, Ministry of Health, Ministry of Education, African Centre for Statistics and primary data collection.

2. Effects and Costs in Health

When a child is undernourished, he or she will have an increased chance of experiencing specific health problems. Children who are underweight are also more likely to die from illnesses related to undernutrition.

The study estimated that in 2009 in Swaziland, there were 25,446 incremental episodes of illnesses that can be associated with the higher vulnerability of underweight children of becoming sick. The biggest proportion of episodes is found in diarrhoea with 2,720 incremental episodes for underweight children, followed by acute respiratory infections, with 1,656 annual episodes.

The treatment of undernutrition and related illnesses is a critical recurrent cost for the health system. Treating a severely underweight child, for example, requires a comprehensive protocol that is often more costly than the monetary value and effort needed to prevent undernutrition, especially when other diseases are also present. These costs generate a significant burden not just for the public sector, but for society as a whole.

Morbidity Episodes and Related Costs Associated with Undernutrition, 2009
(Costs in thousands)

Pathology	Number of episodes	Cost in Swazi Lilangeni (SZL)	Cost in USD	% of episodes	% of Cost
Underweight	16,840	51,311	6,037	66%	85%
Low birth weight (IUGR)	2,751	5,611	660	11%	9%
Anaemia	1,262	1,106	130	5%	2%
Acute diarrheal syndrome (ADS)	2,720	1,670	196	11%	3%
Acute respiratory infection (ARI)	1,656	795	93	7%	1%
Fever/Malaria	217	204	24	1%	0%
Total	25,446	60,697	7,140		

Research shows that undernourished children under 5 have an increased risk of dying. Among the total child mortalities in Swaziland from 2005 to 2009, it was estimated that there were 1,351 child mortalities associated with undernutrition. These deaths represent 8 percent of all child mortalities for this period.

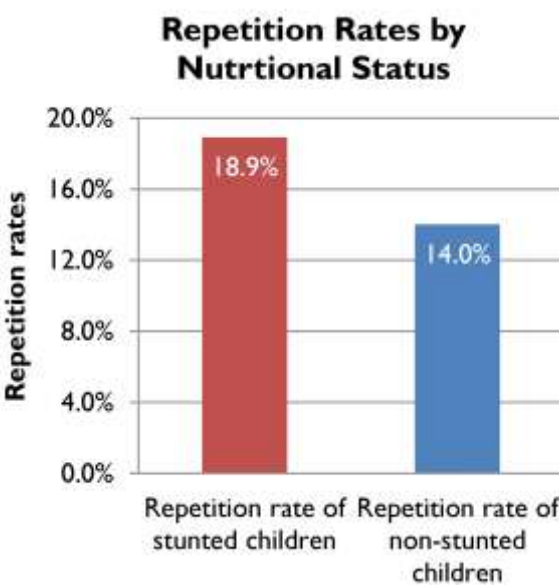
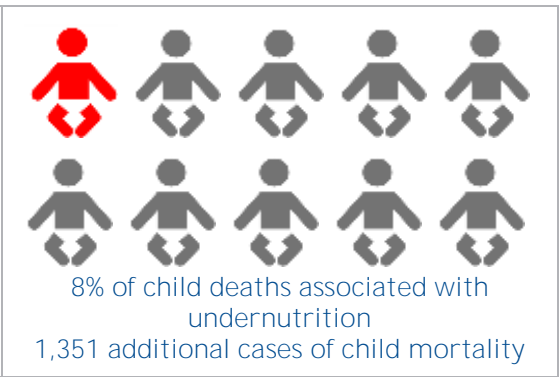
The costs associated with mortality are identified in losses to national productivity. If these children were able to reach adulthood, they could have contributed to the economy.

3. Effects and Costs in Education

There is no single cause for repetition and dropout in school. However, there is substantive research showing that students who were stunted before the age of 5 are more likely to underperform in school.

Based on official information provided by the Ministry of Education and Training, 47,371 children repeated grades in 2009 (15.1 percent). Based on the increased risk of repetition among stunted students, the model estimated that the repetition rate for stunted children was 18.9 percent, while the repetition rate for non-stunted children was 14.1 percent. Based on these rates and the proportion of stunted students, the model estimated that 5,550 repetitions, or 10.1 percent of all repetitions in 2009 were associated with undernutrition

These children are currently generating an incremental cost to the education system, as they require twice as many resources to repeat the year. In addition, the caretakers also have to cater to their educational cost for an extra year.

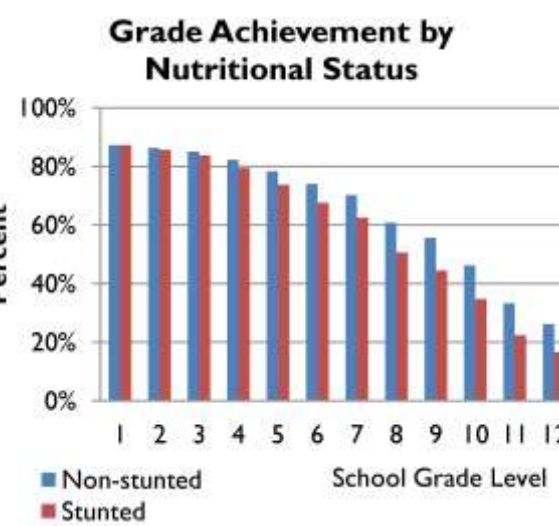


Repetitions in School and Related Costs Associated with Stunting
(Costs in thousands)

	Primary	Secondary	Total
Number of repetitions associated with stunting	4,792	758	5,550
Total public costs (SZL)	2,683.6	1,516.3	4,199.8
Total private costs (SZL)	1,287.9	475.7	1,763.6
Total (SZL)	3,971.4	1,992.0	5,963.4
Total public costs (USD)	315.7	178.4	494.1
Total private costs (USD)	151.5	56.0	207.5
Total (USD)	467.2	234.4	701.6

Students who were stunted are also more likely to drop out of school.

According to available data and relative risks of the consequences of stunting in education, it can be estimated that 70.3 percent of the non-stunted population completed primary school, compared to only 63 percent of stunted children. Similar trends are observed in secondary school, where an estimated 26 percent of non-stunted people and less than 17 percent of the stunted people completed secondary school. The costs associated with school dropouts are reflected in the productivity losses experienced by individuals searching opportunities in the labour market. As such, the impact is not reflected in the school-age population, but in the working-age population, particularly in non-manual activities.



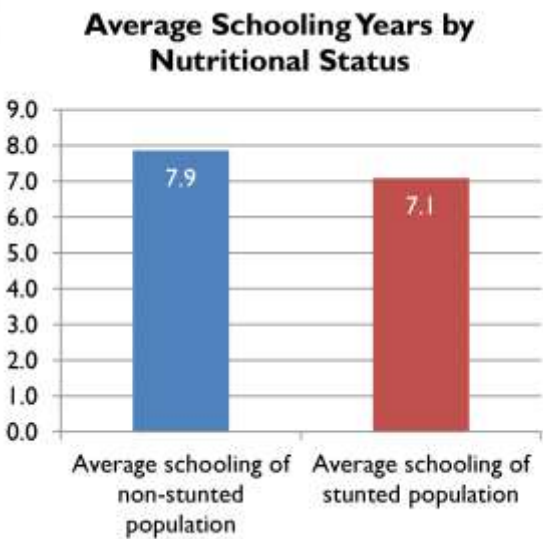
4. Effects and Costs in Productivity

The model estimated that 40 percent of the working-age population in Swaziland were stunted at childhood. Research shows that adults who suffered from stunting as children are less productive than non-stunted workers and are less able to contribute to the economy. This represents 270,188 people in 2009 whose productive potential was affected by undernutrition.

Productivity losses associated with stunting affect both workers in non-manual labour (37.8 percent of the labour force in Swaziland) and those in manual activities (62.2 percent of workers).

Stunted people, on average, have achieved fewer years of schooling than non-stunted people. In non-manual activities, higher academic achievement is directly correlated with higher income. It is estimated that the educational gap between the stunted and non-stunted population is 0.8 years and associated annual losses are SZL251 million, which is equivalent to 1 percent of the GDP in 2009.

Research shows that stunted workers engaged in manual activities tend to have less lean body mass and are more likely to be less productive in manual activities than those who were never affected by growth retardation. The model estimated that 416,702 people in Swaziland work in manual activities, of which 175,432 were stunted as children. This represented annual losses surpassing SZL126 million, equivalent to 0.5 percent of GDP, in potential income lost due to lower productivity.



Productivity Losses Associated with Stunting
(Costs in thousands)

Age group in 2009	Population in non-manual labour who were stunted (thousands)	Loss in productivity in non-manual activities (SZL)	Loss in productivity in non-manual activities (USD)	Population in manual labour who were stunted	Loss in productivity in manual activities (SZL)	Loss in productivity in manual activities (USD)
15-24	46,773	43,341	5,099	75,603	26,948	3,170
25-34	27,423	89,184	10,492	43,591	32,709	3,848
35-44	15,427	56,623	6,661	24,769	25,677	3,021
45-54	11,002	43,600	5,125	18,420	24,673	2,903
55-64	7,562	18,153	2,136	13,048	16,169	1,902
Total	108,187	250,861	29,153	175,431	126,176	14,844
% GDP		1.00%			0.50%	



Undernutrition-related mortalities contribute to losses in potential national productivity. The model estimated the **nation's workforce has** 16,019 fewer people because of child mortality associated with undernutrition. This represents a 2.4 percent reduction in the current workforce.

Considering the productive levels of the population, by their age and sector of labour, the model estimated that in 2009, the economic losses (measured by working hours lost due to undernutrition-related child mortality) are SZL 340 million, which **represented 1.4 percent of the country's GDP.**

Productivity Losses due to Mortality Associated with Undernutrition
(All values in thousands)

Age in 2009	Working hours lost	Loss in productivity (SZL)	Loss in productivity (USD)
15-24	8,364.8	28,488.9	3,351.6
25-34	8,251.2	65,534.7	7,710.0
35-44	7,852.4	82,236.0	9,674.8
45-54	6,746.8	87,775.6	10,326.5
55-64	6,269.0	75,565.0	8,890.0
Total	37,484.3	339,600.2	39,953.0
% GDP		1.4%	

5. Summary of Costs

For Swaziland, the total losses associated with undernutrition are estimated at SZL783 million (USD92 million) for the year 2009. These losses were equivalent to 3.1 percent of GDP of that year.



6. Analysis of Scenarios

The model can generate various baseline scenarios, based on nutritional goals established in each country. Scenarios which were agreed upon with the national implementation team in Swaziland, can be used to advocate for increased investments in proven nutritional interventions.

These scenarios are constructed based on the estimated costs of the children born in each year, from 2009 to 2025 (net present value). While the previous section calculated the costs incurred in a single year by historical trends of undernutrition, these costs represent the present values and savings generated by children born during 2009 to 2025.

Scenarios Analysed

Baseline: The cost of inaction — Progress in reduction of stunting and underweight child stops

For the baseline, the progress of reducing the prevalence of undernutrition stops at the level achieved in 2009. It also assumes that the population growth would maintain the pace reported in the year of the analysis, hence increasing the number of undernourished children and the estimated cost. As this scenario is highly unlikely, its main purpose is to establish a baseline to which any improvements in the nutritional situation are compared in order to determine the potential savings in economic costs.

Scenario #1: Cutting by half the prevalence of child undernutrition by 2025

In this scenario, the prevalence of underweight and stunted children would be reduced to half of the 2009 values corresponding to the reference year. In the case of Swaziland this would mean a constant reduction of 0.9 percent points annually in the stunting rate, from 29.5 percent (estimate for 2009) to 14.8 percent in 2025. With the right combination of proven interventions, this scenario would be achievable, as the average rate of reduction for stunting between 2000 and 2006 was estimated at 0.9 percentage points, which is higher than the progress rate required in achieving this scenario. Nevertheless, in 2008, a national survey appeared to show an important increase in the prevalence rate, which might indicate the need for a new survey to validate the current levels of stunting in the country.

Scenario #2: The goal scenario — Reduce stunting to 10 percent and underweight children to 5 percent by 2025

In this scenario, the prevalence of stunted children under 5 would be reduced to 10 percent, and the prevalence of underweight children under the age of 5, to 5 percent. Currently, the global stunting rate is estimated at 26 percent, with Africa having the highest prevalence at 36 percent. This goal scenario, would require a true call for action, and would represent an important continental challenge towards which countries on the continent could collaborate to achieve. The progress rate required to achieve this scenario would be a 1.2 percent points annual reduction over 16 years, from 2009 to 2025.

In the baseline, where progress in reducing child undernutrition would stop at the level of 2009, the cost in 2025 would reach SZL265.3 million (USD31.2 million).

In Scenario #1 in which a reduction of half of the current prevalence is achieved, the cost in 2025 would reduce to SZL165.6 million (USD19.5 million). For the full period between 2009 to 2025, this would represent a savings of SZL401.7 million (USD47.3 million). Although the tendency of savings would not be linear, as they would increase over time as progress was achieved, a simple average of the annual savings would represent SZL25.1 million (USD3.0 million) per year.

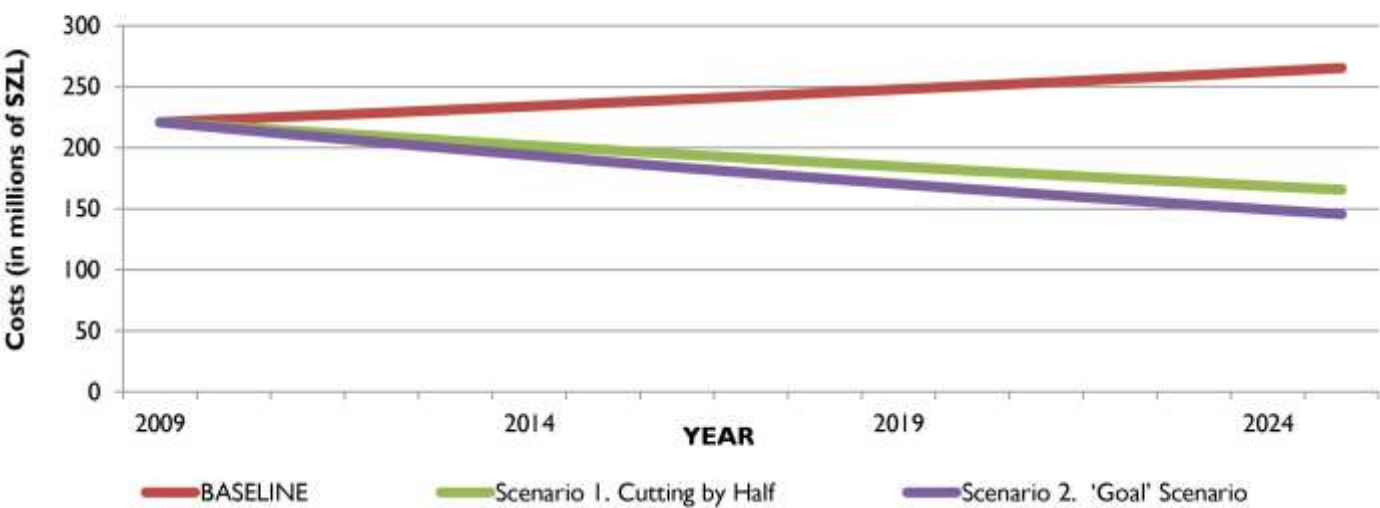
In the case of the goal scenario, the cost in 2025 would be reduced to SZL145 million (USD17.1 million). This translates into an increase in total savings to SZL511.2 million, (USD60.1 million), which represents SZL31.9 million (USD3.8 million) per year, for the same 16-year period.

Costs and Savings by Scenario
(All values in millions)

	Baseline		S1. Cutting by Half		S2. Goal Scenario	
	SZL	USD	SZL	USD	SZL	USD
Projected cost in the year 2025	265.3	31.2	165.6	19.5	145.5	17.1
Total projected savings (2009-2025)			401.7	47.3	511.2	60.1
Annual projected savings (2009-2025)*			25.1	3.0	31.9	3.8
Annual percentage points reduction in stunting rates required to achieve scenario (2009-2025)	Progress stops		0.9%		1.2%	

*Simple average

Trends of Estimated Costs of Child Undernurttion,
2009-2025



7. Conclusions and Recommendations

The Cost of Hunger in Africa (COHA) Study presents an opportunity to better understand the role that child nutrition can play as a catalyst for social and economic transformation and human development.

In Swaziland, the results of the study strongly suggest that to achieve sustainable human and economic growth, special attention must be given to addressing nutrition in the early stages of an individual's life. The study estimates that child undernutrition generates health costs equivalent to 0.6 percent of the total public budget allocated to health, and that only three out of every 10 children are estimated to be receiving proper health attention. The study further demonstrates that nearly one out of every 10 reported child deaths is associated to undernutrition. With regards to education, the results show that 10.1 percent of all grade repetitions in school are associated with the higher incidence of repetition experienced by stunted children.

Some of the key findings of the study indicate the need for scaling up current interventions and developing innovative solutions to fight child undernutrition in Swaziland. Going forward, it is recommended that the Government of Swaziland reviews their national development frameworks to ensure that the reduction of stunting is an outcome indicator of their social and economic development policies; sets aggressive targets for the reduction of stunting; puts in place a comprehensive multi-sectoral policy in which the role of international aid is complementary to nationally led investments; implements a more systematic approach with shorter periodicity to measure short-term results in preventing stunting; and includes information in the assessment that relates the nutritional status of the children to the livelihoods and economic activities of the households.

Detailed country-specific recommendations were presented at the launch of the Swaziland country report on 18 July 2013 by the Ministry of Economic Planning and Development. The report was officially endorsed by the Chief Economist of the Ministry.



Country Results: Uganda



1. Introduction

Uganda’s economy has experienced a positive trend over the last decade, with growth rates that exceeded 10 percent in 2008. Nevertheless, recently the economy has experienced a slowdown, with high inflation rates and currency depreciation. Even with these constraints, there was a positive outlook for 2012 and 2013, driven in part by the oil sector.

Poverty remains a significant challenge for Ugandans. In 2009-2010, approximately 7.5 million Ugandans lived in 1.2 million households considered poor, representing 24.5 percent of the country’s population. The incidence of poverty is higher in rural areas, where approximately 27.2 percent of the population lives below the poverty line, as compared to 9.1 percent in urban areas.

The recent improvement in poverty rates has also been accompanied by a reduction in child undernutrition, particularly in stunting rates. According to the 2011 Demographic and Household Survey (DHS), approximately 33.4 percent of Ugandan children under the age of 5 were suffering from low height for their age (stunting), which represents an important improvement from the 38.1 percent reported by DHS in 2006. Additionally, the prevalence of underweight children has also improved from 16.4 percent to 13.8 percent. For that same period, the level of low birth weight prevalence in children has also remained steady, at around 10 percent.

The COHA study in Uganda is led by the National Planning Authority (NPA), with support from the Ugandan Bureau of Statistics, the Ministry of Education, the Office of the Prime Minister and the World Food Programme, among others.

During the process, all data for the study were collected from national data sources, including the Uganda National Household Survey 2009-2010, Population and Housing Census 2002, DHS 2011 and previous DHS studies published by Ugandan Bureau of Statistics, demographic data from the African Centre for Statistics (ACS) and UN Population Division, as well as primary data collection.

2. Effects and Costs in Health

When a child is undernourished, he or she will have an increased chance of experiencing specific health problems. Children who are underweight are also more likely to die from illnesses related to undernutrition.

The study estimated that in 2009 in Uganda there were almost 1.6 million more episodes of illness related to diseases associated with being underweight. The highest occurrence of episodes was with diarrhoea, with almost 289,994 more episodes in underweight children, followed by fever, with over 121,943 annual episodes.

The treatment of undernutrition and related illnesses is a critical recurrent cost for the health system. Treating a severely underweight child, for example, requires a comprehensive protocol that is often more costly than the monetary value and effort needed to prevent undernutrition, especially when other diseases are also present. These costs generate a significant burden not just to the public sector but to society as a whole.

Morbidity Episodes and Related Costs Associated with Undernutrition
(Costs in millions)

Pathology	Number of episodes	Cost in Ugandan Shillings (UGX)	Cost (USD)	% of episodes	% of cost
Underweight	975,450	369,477	178.6	63%	70%
Low birth weight (IUGR)	82,635	134,342	64.9	5%	26%
Anaemia	55,923	1,313	0.6	4%	0%
Acute diarrhoeal syndrome (ADS)	289,994	4,778	2.3	19%	1%
Acute respiratory infection (ARI)	27,462	1,971	1.0	2%	0%
Fever/Malaria	121,943	13,954	6.7	8%	3%
Total	1,553,407	525,835	254.1		

Research shows that undernourished children under 5 have an increased risk of dying. From 2005 to 2009, it was estimated there were 110,220 child mortalities in this age group associated with undernutrition. These deaths represented 15 percent of all child mortalities for this period.

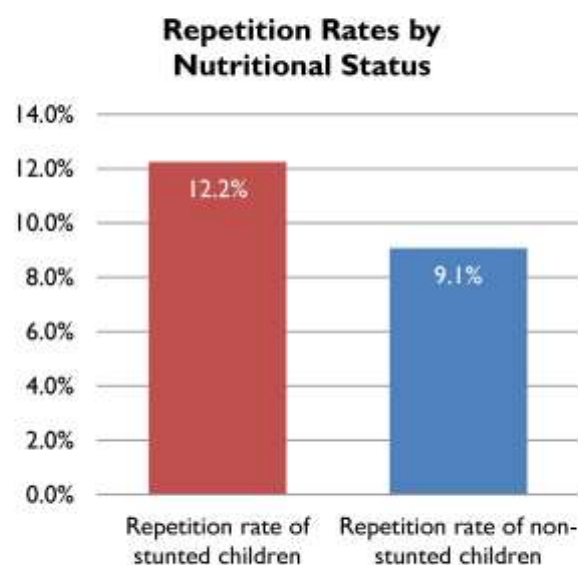
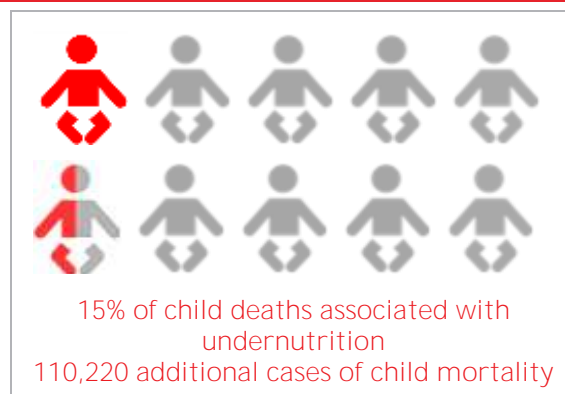
The costs associated with mortality are identified in losses to national productivity. If these children were able to reach adulthood, they could have contributed to the economy.

3. Effects and Costs in Education

There is no single cause for repetition and dropout; however, there is substantive research that shows that students who were stunted before the age of 5 are more likely to underperform in school.

Based on official information provided by the Ministry of Education, over 1.8 million children repeated grades in 2009 (10.7%). Based on the increased risk of repetition among stunted students, the model estimated that the repetition rate for was 12.2 percent while the repetition rate for non-stunted children was estimated at 9.1 percent. Based on these rates and the proportion of stunted students, the model estimated that 128,970 repetitions, or 7.3 percent of all repetitions in 2009 were associated with undernutrition

These students generate an incremental cost to the education system, as they require twice as many resources to repeat the year. In addition, the caretakers also have to pay for an additional year of education.



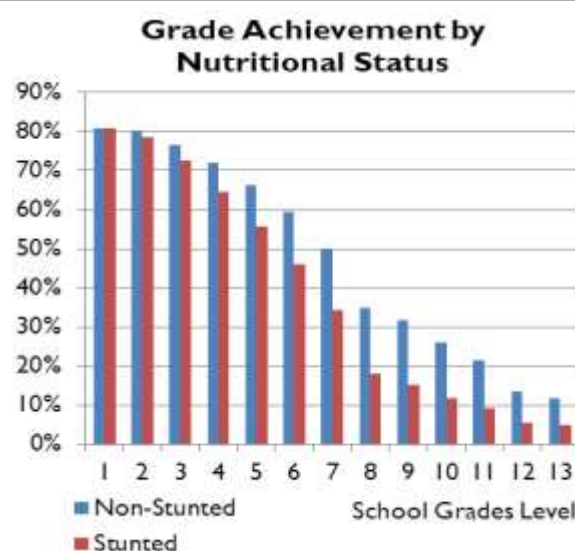
Repetitions in School and Related Costs Associated with Stunting
(Cost in millions)

	Primary	Secondary	Total Costs
Number of repetitions	128,970	4,961	133,931
Total public costs (UGX)	8,050	1,037	9,086
Total private costs (UGX)	8,090	2,478	10,569
Total (UGX)	16,140	3,515	19,655
Total public costs (USD)	3.9	0.5	4.4
Total private costs (USD)	3.9	1.2	5.1
Total (USD)	7.8	1.7	9.5

Students who were stunted are also more likely to drop out of school.

According to the available data and relative risks of stunting on education, it can be estimated that 50 percent of the non-stunted population completed primary school, compared to only 34.2 percent of stunted children. Similar trends are observed in secondary school, where an estimated 11.9 percent of non-stunted children and less than 4.8 percent of stunted children completed secondary school.

The costs associated with school dropouts are reflected on the productivity losses experienced by individuals searching opportunities in the labour market. As such, the impact is not reflected in the school-age population, but in the working-age population, particularly in non-manual activities.



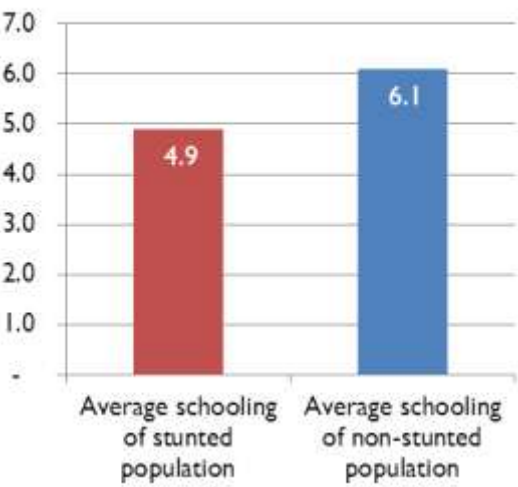
4. Effects and Costs in Productivity

The model estimated that 54 percent of the working-age population in Uganda were stunted as children. Research shows that adults who suffered from stunting as children are less productive than non-stunted workers and are less able to contribute to the economy. This represents more than 8 million people in Uganda whose productive potential is affected by undernutrition.

Productivity losses associated with stunting affect both workers in non manual labour (9 percent of the labour force in Uganda) as well as those in manual activities (91 percent of workers). Stunted workers, on average, have achieved fewer years of schooling than non-stunted workers. In non-manual activities, higher academic achievement is directly correlated with higher income. The average schooling of the non-stunted population is estimated at 1.2 years more than for people who suffered from childhood stunting. The associated annual losses are UGX241 billion, equivalent to 0.7 percent of the GDP in 2009.

Research shows that stunted workers engaged in manual activities tend to have less lean body mass and are more likely to be less productive in manual activities than those who were never affected by growth retardation. The model estimated that 13.1 million Ugandans are engaged in manual activities, of which 7.1 million were stunted as children. This represented annual losses surpassing UGX417 billion, equivalent to 1.28 percent of GDP, in potential income lost due to lower productivity.

Average Schooling Levels by Nutritional Status



Productivity Losses Associated with Stunting
(Costs in millions)

Age group in 2009	Population in non-manual labour who were stunted (thousands)	Loss in productivity in non-manual activities (UGX)	Loss in productivity in non-manual activities (USD)	Population in manual labour who were stunted (thousands)	Loss in productivity in manual activities (UGX)	Loss in productivity in manual activities (USD)
15-24	360	51,549	24.9	2,934	140,094	67.7
25-34	301	60,245	29.1	1,877	133,737	64.6
35-44	174	59,834	28.9	1,177	72,160	34.9
45-54	81	56,045	27.1	705	55,700	26.9
55-64	30	13,390	6.5	417	15,241	7.4
Total	945.6	241,063	116.5	7,110	416,932	201.5
% GDP		0.7%			1.28%	

An estimated 54% of the working age population, or 8 million people, were stunted as children.

Undernutrition-related mortalities contribute to losses in potential national productivity. The model estimated the **nation's workforce has** 567,048 fewer people because of child mortality associated with undernutrition. This represents a 3.8% reduction in the current workforce.

Considering the productive levels of the population by their age and sector of labour, the model estimated that in 2009 the economic losses (measured by working hours lost due to undernutrition-related child mortality) amounted to UGX 656.6 billion, which represented 2% of the country's GDP.

Productivity Losses due to Mortality
Associated with Undernutrition
(All values in millions)

Age group in 2009	Working hours lost	Loss in productivity (UGX)	Loss in productivity (USD)
15-24	298	163,984	79.3
25-34	236	180,188	87.1
35-44	175	127,031	61.4
45-54	125	126,985	61.4
55-64	108	58,416	28.2
Total	943	656,604	317.3
% GDP		2.0%	

5. Summary of Costs

For Uganda, the total losses associated with undernutrition were estimated at UGX1.9 trillion (USD899 million) for the year 2009. These losses were equivalent to 5.6 percent of GDP of that year.



6. Analysis of Scenarios

The model can generate various baseline scenarios, based on nutritional goals established in each country. Scenarios, which were agreed upon with the national implementation team in Uganda, can be used to advocate for increased investments in proven nutritional interventions.

These scenarios are constructed based on the estimated costs of the children born in each year, from 2009 to 2025 (net present value). While the previous section calculated the costs incurred in a single year by historical trends of undernutrition, these costs represent the present values and savings generated by children born during 2009 to 2025.

The scenarios developed for this report are as follows:

Baseline: The cost of inaction — Progress in reduction of stunting and underweight child stops

For the baseline, the progress of reducing the prevalence of undernutrition stops at the levels achieved in 2009. It also assumes that the population growth would maintain the pace reported in the year of the analysis, hence increasing the number of undernourished children and the estimated cost. As this scenario is highly unlikely, its main purpose is to establish a baseline, to which any improvements in the nutritional situation are compared in order to determine the potential savings in economic costs.

Scenario #1: Cutting by half the prevalence of child undernutrition by 2025

In this scenario, the prevalence of underweight and stunted children would be half of the 2009 values corresponding to the reference year. In the case of Uganda this would mean a constant reduction of 1.11% points annually in the stunting rate from 35.5 (estimate for 2009) to 17.8 percent in 2025. With the right combination of proven interventions, this scenario would be achievable, as the average rate of reduction for stunting between 2001 and 2011 was estimated at 1.14 percentage points, which is higher than the progress rate required in achieving this scenario. Nevertheless, for the period 2006-2011, a minor slowdown in the reduction rate (1.06 percentage points) was registered, which appears to indicate that stronger investments are required to continue the downward trend.

Scenario #2: The goal scenario — Reduce stunting to 10 percent and underweight children to 5 percent by 2025

In this scenario, the prevalence of stunted children would be reduced to 10 percent and the prevalence of underweight children under the age of 5 to 5 percent. Currently, the global stunting rate is estimated at 26 percent, with Africa having the highest prevalence at 36 percent. This goal scenario, would require a true call for action and would represent an important continental challenge, in which countries on the continent could collaborate jointly in its achievement. The progress rate required to achieve this scenario would be 1.6 percentage points annual reduction for a period of 16 years, from 2009 to 2025.

In the baseline, where progress in reducing child undernutrition would stop at the level of 2009, the cost in 2025 would reach UGX 1.4 billion (USD670.0 million).

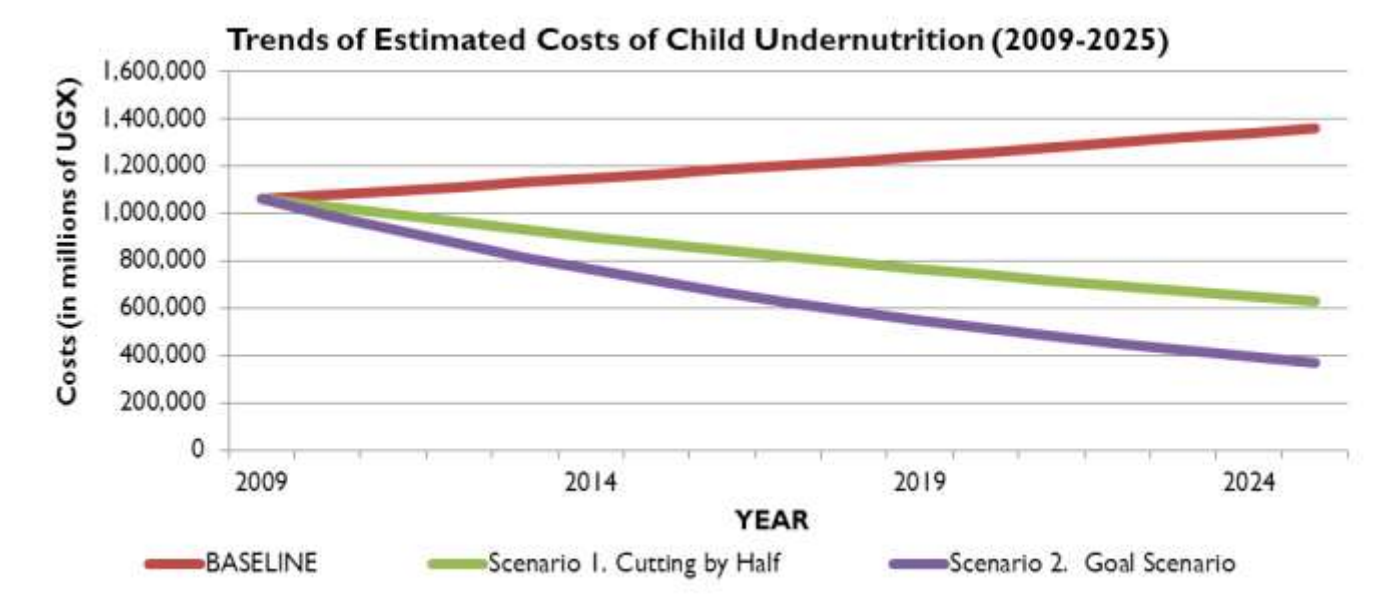
In Scenario #1 in which a reduction of half of the current prevalence is achieved, the cost in 2025 would reduce to UGX627.7 million (USD309.1 million). For the full period between 2009 to 2025, this would represent a total savings of UGX2.9 billion (USD1.4 billion). Although the tendency of savings would not be linear, as they would increase over time as progress was achieved, a simple average of the annual savings would represent UGX179.3 million (USD88.3 million) per year.

In the case of the goal scenario, the cost in 2025 would be reduced to UGX368.0 million (USD181.2 million). This translates into an increase in total savings to UGX4.3 billion (USD2.1 billion), which represents UGX266.9 million (USD131.5 million) per year, for the same 16-year period.

Costs and Savings by Scenario
(UGX values in billions, USD values in millions)

	Baseline		S1. Cutting by Half		S2. Goal Scenario	
	UGX	USD	UGX	USD	UGX	USD
Projected cost in the year 2025	1,359.8	669.7	627.7	309.1	368.0	181.2
Total projected savings (2009-2025)			2,869.2	1,413.1	4,270.6	2,103.2
Annual projected savings (2009-2025)*			179.3	88.3	266.9	131.5
Annual percentage points reduction in stunting rates required to achieve scenario (2009-2025)	Progress stops		1.14%		1.6%	

*Simple average



7. Conclusions and Recommendations

The Cost of Hunger in Africa (COHA) Study presents an opportunity to better understand the role that child nutrition can play as a catalyst for social and economic transformation and human development.

In Uganda, the results of the COHA study strongly suggest that to achieve sustainable human and economic growth, special **attention must be given to addressing nutrition in the early stages of an individual's life. The study estimates that child undernutrition generates costs equivalent to 11 percent of the total public budget allocated to health and that 15 percent of all cases of child mortality are associated with the higher risk of undernutrition.** With regards to education, the results show that 7.3 percent of all grade repetitions in school are associated to the higher incidence of repetition experienced by stunted children.

Some of the key findings of the study indicate the need for scaling-up current interventions and developing innovative solutions to fight child undernutrition in Uganda. Going forward, it is recommended that the Government of Uganda promotes access to and the use of essential health services; scales up food fortification for school-going children and children older than six months; explores further opportunities in bio-fortification; and addresses bottlenecks that undermine the efficiency of existing interventions, thus maximizing the results achieved through these interventions.

Detailed country-specific recommendations were presented at the launch of the Uganda country report on 20 June 2013 by H.E. Amama Mbabazi, Prime Minister of Uganda.

Conclusions

Child Undernutrition: Implications for the Implementation of Africa's Transformation Agenda

The Cost of Hunger in Africa Study is an important step forward to better understand the role that child nutrition and human development can play as a catalyser, or as a constraint, in the social and economic transformation of Africa.

Health Sector

- Child undernutrition generates health costs equivalent to between 1 and 11 percent of the total public budget allocated to health. These costs are due to episodes directly associated with the incremental quantity and intensity of illnesses that affect underweight children and the protocols necessary for their treatment.
- In the larger proportion of these episodes, 69 to 82 percent, ill children do not seek medical attention or are treated at home, increasing the risk for complications and providing evidence of an unmet demand for health care.

Eliminating the inequality in access to health care is a key element of the social transformation agenda in Africa which requires, as a precondition, a reduction of the rural/urban coverage gap. As health coverage expands to rural areas, there will be an increase of people seeking medical attention; this can potentially affect the efficiency of the system to provide proper care services. This study illustrates that a reduction of child undernutrition could facilitate the effectiveness of this expansion by reducing the incremental burden generated by the health requirements of underweight children.

Education Sector

- Children who were stunted experienced higher repetition rates in school ranging from 2 to 4.9 percent.
- Moreover, 7 to 16 percent of all grade repetitions in school are associated with the higher incidence of repetition among stunted children, the majority (90 percent), of which occurs in primary school.
- These numbers suggest that a reduction in stunting prevalence could support an improvement in school quality, as it would reduce preventable burdens to the education system.

Increasing the educational levels of a population, and maximizing the productive capacity of Africa's population dividend, is a key element in increasing competitiveness and innovation on the continent. This represents a particular opportunity in sub-Saharan Africa where the population under 15 years is estimated to be 40 percent of the total population. Children and youth must be equipped with the skills necessary for competitive labour. Thus, underlying causes for low school performance and early dropout must be addressed. As there is no single cause for this phenomenon, a comprehensive strategy must be put in place that considers improving the quality of education and the conditions required for school attendance. This study demonstrates that stunting is one barrier to attendance and retention that must be removed to effectively elevate educational levels and improve individuals' labour opportunities in the future.

Labour Productivity

- 52 percent of the working age population in the analysed countries is currently stunted.
- This population has achieved, on average, lower school levels than those who did not experience growth retardation, ranging from 0.2 to 1.2 years of less schooling.
- The working-age population has been diminished by 1 to 8 percent due to child mortality associated with undernutrition.

On the continent, more than half of the population is expected to live in cities by 2050. An important component to prepare for this shift is to ensure that the workforce is ready to make a transition towards a more skilled labour, and economies are able to produce new jobs to reduce youth unemployment. By preventing child stunting, thus avoiding the associated loss in physical and cognitive capacity that hinders individual productivity, people can be provided with a more equal opportunity for success.

Potential Economic Savings

- The model estimated that a reduction of the prevalence to half of the level by the year 2025 can generate annual average savings from USD3 million to USD 76 million for the analysed countries.
- An additional scenario estimates that a reduction to 10 percent stunting and 5 percent underweight could yield annual average savings from USD4 million to USD784 million.

This economic benefit that would result from a decrease in morbidities, lower repetition rates and an increase in manual and non-manual productivity, presents an important economic argument for the incremental investments in child nutrition. This does not only impact those people affected by undernutrition, but the society as a whole.

Evidence-Based Policy and South-South Collaboration

- COHA is an important example of how South-South collaboration can work to implement cost effective activities in development and knowledge sharing. It demonstrated that developing and implementing tools that are sensitive to the particular conditions of the continent is feasible.
- It illustrates the valuable role that data and government-endorsed research can play in shedding light on pertinent issues on the continent. Although the availability of uniform and readily-available data in Africa is limited, the COHA results have shown that analysis has the potential to bring the issue of child nutrition to the forefront of the development arena.

Policy Recommendations

Stunting is a useful indicator to evaluate effective social policies. The causes of and solutions for chronic hunger are linked to social policies across numerous sectors. As such, the reduction of stunting will require interventions from the health, education, social protection and social infrastructure perspectives. Reduction of stunting can be an effective indicator of success in larger social programmes.

Aggressive goals are necessary to address stunting. This study encourages countries not to be content with **“acceptable” numbers of children that are in a disadvantaged position due to stunting, and affirms that equal opportunity** should be the aspiration of the continent. Therefore, it is recommended that aggressive targets be set in Africa for the reduction of stunting that go beyond the proportional reduction, to establish an absolute value of 10 percent as the goal for the region. Countries with high and very high levels of stunting (over 30 percent) might pursue an interim goal of reducing to 20 percent. These advances would go a long way towards levelling the social and economic outcomes arising from childhood food intake, between children in the developing world and children in the developed world.

A multi-causal problem requires a multi-sectoral response. This aggressive goal cannot be attained by the health sector alone. In order to make a decisive impact on improving child nutrition, a comprehensive multisectoral policy must be put in place, backed up by strong political commitment and with the allocation of adequate resources for its implementation.

Efficient rural economies and effective social protection schemes are key drivers for the sustained reduction of child undernutrition. Fostering rural economies, by enhancing the productivity of agricultural activities and expanding the non-agricultural activities, is a key element in accelerating the reduction of malnutrition. Work carried out by the Comprehensive Africa Agriculture Development Programme, and the development of value chains of strategic agricultural commodities, can be key elements to focus efforts on in the coming years. Additionally, it is important to consider the role of social protection programmes in reducing hunger and malnutrition, in order to achieve an appropriate combination of transfers and services that is adequate for each context.

Sustainability requires strong national capacity. To ensure the sustainability of these actions, the role of international aid must, whenever possible, be complementary to nationally led investments, and further efforts must be made to ensure the strengthening of national capacity to address child undernutrition.

Monitoring is needed for progress. To measure short-term results for the prevention of stunting, a more systematic approach with a shorter periodicity is recommended, such as two to three years between each assessment. As prevention of child undernutrition should target children under 2 years of age, during their first 1,000 days, these results would provide information to policymakers and practitioners on the immediate effectiveness of social protection and nutrition programmes.

Long-term commitment is necessary to achieve results. The COHA initiative represents a valuable opportunity **to place nutrition within a strategy to ensure Africa’s sustainable development. As the deadline for Millennium Development Goals** nears, new priorities and targets will be set that will serve to guide development policies in years to come. It is recommended that prioritization of the elimination of stunting should not only be presented in the traditional forums, but should also be included in the wider discussions on development, as a concern that affects the economic transformation of Africa.

Some questions still need to be answered

The COHA represents an important step forward in shedding light on the importance of nutritional investments, as a fundamental basis for human development. Nevertheless, the process also served as an important exercise to identify gaps in knowledge that can help increase the dimensions of the analysis, including the following:

- ➔ Sub-national differences in the social and economic impacts of child undernutrition. There is an opportunity to raise the advocacy for sub-regional and local actions by developing a model to distribute the cost of hunger by region and further engage local governments and communities in the implementation of local actions to improve nutrition.
- ➔ **The impact of early child malnutrition on women's contributions to the household.** As most women in Africa are responsible for household chores and caring activities, their contributions are not accurately measured by proxy of labour productivity but, rather, by their capacity to provide wellbeing in the household. Nevertheless, the intensity in which this capacity is affected as a consequence of child malnutrition is not comprehensively addressed in current literature.
- ➔ There are still gaps of region-specific risk analysis in Africa, particularly in educational outcomes and labour productivity. A comprehensive analysis of a longitudinal study in Africa can also serve as an important source of information to update further the relative risks faced by undernourished children, in different aspects of their lives.
- ➔ Complementary analysis could be carried out to further understand the sectoral consequences of undernutrition. Additional multi-variable analysis could also help to explain variations across countries.



Reactions to the Cost of Hunger in Africa Study

“The Cost of Hunger Study provides us with the evidence base for building a case for food security, communication, advocacy and policy discourse on nutrition. The study reveals that we can no longer afford to have high prevalence rates of under-nutrition and has given the justification for increasing investment in scaling up nutrition interventions and ensure availability of food and good nutrition.”

- Prime Minister Amama Mbabazi of Uganda

“We have national government on board, we have the African Union on board, we have NEPAD, we have national governments on board as supporters...”

- Elisabeth Rasmusson, WFP Assistant Executive Director

“We [tend to] still look into handling this [nutrition] issue from the aspect of spending or charity work. This should be viewed as investment, not as extra cost of spending or charity work.”

- Mohamed Enrees, Egyptian Ambassador to the African Union

“We are talking about demographic dividends. And I can’t think of a better way to starting to earn this dividend – and when we talk about preparing our youth, preparing our children, [we should think] in terms of nutrition and getting them to the position to eventually become productive members of their community. We will use [COHA] to plan our post 2015 agenda and what we want to achieve.”

- Mustapha Kaloko, Commissioner of Social Affairs, AUC

“I think we have made the case in front of the ministers of finance, economic development and planning about the need for us to invest a lot in human capital. It is one of the tracks that will make this transformation possible. What we have not said enough is how we are going to go about developing human capital... human capital starts with children, and if we don’t take care of them in terms of nutrition, the costs are very high.

We always talk about returns on investments and the returns on this investment are underrated. This is a unique and important investment, but we need to make the case in much stronger terms. That’s why the research done in Africa and providing evidence-based contributions is extremely important. And this study is already producing this with its reports.”

- Carlos Lopes, Executive Secretary of ECA

“I want to commend this project. It is an eye-opener, and it needs to be encouraged. We are grateful to be part of this important [study]. We know we don’t have the means to change it all overnight, but we are doing a lot.”

- Prince Hlangusemphi Dlamini, Minister of Economic Planning and Development, Swaziland

“Like in Latin America, the analysis in Africa shows that —beyond the social and ethical dimensions— undernutrition and its consequences have a major impact on the economies, and this is a warning of how urgently action is needed. Moreover, this study is particularly relevant for ECLAC as a clear example of South-South cooperation and speaks to the importance of sharing experiences, analytical frameworks and methodologies between Africa and Latin America and the Caribbean.”

- Alicia Bárcena, Executive Secretary of ECLAC