COHA estimates put the Cost of Undernutrition in Mozambique as 11% of GDP (1.6 billion USD) in 2015

The Context

From 2007-2015, Mozambique experienced impressive levels of economic expansion, with average growth rates higher than the rest of Sub-Saharan Africa. Poverty rates have also improved slightly, though the GINI index (a measure of disparity between the rich and poor) only saw nominal improvement (see table below).

Despite this economic progress, the same time period in Mozambique witnessed disturbing rates of child undernutrition – both stunting (chronic malnutrition) and underweight, with stunting barely showing any improvement at all over the past 25 years (42% in 2015), see graph below. With an under-five population of 4.8 million in 2015, this translated to approximately 2.06 million children stunted.

Disaggregation by district and age reveals an even starker picture, with children between 12 and 23 months of age at a stunting prevalence of 47%, and in the northern provinces of Nampula and Cabo Delgado, stunting of under-fives exceeds 50%.1

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<tbody>
<tr>
<td>GDP in billions of USD</td>
<td>10.4</td>
<td>12.50</td>
<td>15.90</td>
</tr>
<tr>
<td>GNI (Gross National Income) per Capita</td>
<td>440.00</td>
<td>486.00</td>
<td>600.00</td>
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<tr>
<td>Poverty - $1.90 per day (PPP) (% of population)*</td>
<td>68.74</td>
<td>60</td>
<td></td>
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<tr>
<td>GINI Index (Measure of Disparity)</td>
<td>45.6</td>
<td>42</td>
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The Cost of Hunger in Africa (COHA)

COHA utilizes a two-dimensional analysis to estimate the costs arising from the consequences of child undernutrition in health, education and productivity. Its retrospective dimension analysis examines the history of child undernutrition in a country, and estimates the current economic and social consequences. To complement this analysis, a prospective analysis is used to project and generate scenarios that reveal the potential savings associated with proposed reductions in undernutrition, e.g. the cost savings associated with reducing stunting and underweight by half within 10 years.

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

1 http://www.pop tel.org.uk/mozambique-news/
We now know that chronic malnutrition undermines both physical and cognitive development of children, leading to reduced educational outcomes as children/youth, and higher absenteeism and reduced income as adults. These consequences have a ripple effect on families, communities, and ultimately, on a nation’s economy at large.

While the price tag attached to delivering various nutrition interventions is frequently the topic of discussion, policy makers rarely focus on the social and economic cost of not providing these interventions or ‘doing nothing’. Estimating the cost of the problem (i.e. how much is lost if nothing is done and how much could be saved by addressing it) helps put the cost of a solution into its proper perspective.

The Cost of Hunger in Africa (COHA) is an analytical tool that provides policy makers with information on how undernutrition directly impacts economic growth in their country (see figure at right), and offers a detailed financial picture of what a country stands to lose if undernutrition is not addressed. This analysis aims to provide nutrition advocacy efforts with stronger evidence for the need for action on nutrition, across sectors.

The Policy Questions

Cost of Inaction:

What is the total cost of not addressing undernutrition in Mozambique in 2015?

- What are the costs to the Health sector?
- What are the costs to the Education sector?
- What are the costs to Productivity?

Note: Even though the ‘doing nothing’ 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 Analysis:

As a complement to the above set of policy questions, COHA also examines the following scenario-based questions:

- Scenario #1: What savings would be achieved by reducing the prevalence of stunting and underweight to one half their current rates by 2025?
- Scenario #2: What savings would be achieved by reducing the prevalence of stunting to 10% and underweight to 5% by 2025?
The Process

The COHA process took place between June 2016 and September of 2017, and was intentionally timed to coincide with the upcoming review of the national nutrition plan and the development of the next national plan and strategy. It began with a five-day, interactive training which was hosted by Mozambique’s National Food Security and Nutrition Secretariat (SETSAN), with facilitation and technical support provided by the WFP and the Economic Commission for Latin America and the Caribbean (ECLAC), the developers of the original Cost of Hunger tool. Support was also provided by the African Union Commission (AUC) and the New Partnership for Africa’s Development (NEPAD). This was a multi-country training that included teams from the Democratic Republic of the Congo (DRC), Lesotho, Mali, Mauritania and Zimbabwe.

Significant time and effort were dedicated to building the capacity of SETSAN so that they understood the COHA model, how it worked, and how to plan the elements of the analysis. A National Implementation Team (NIT) of various government and non-government stakeholders was formed to advise throughout the COHA process, and to validate the final results. Secondary data was drawn from the 2011 Demographic and Health Survey (DHS), with outcome and cost-related data coming from the Ministries of Finance, Education and Human Development, and various UN agencies. Primary data were also collected in all provinces. The analysis took approximately six months to complete.

Results

There are two sets of results from the COHA analysis. The first describes the cost of hunger in the reference year (2015) in terms of its impact on health, education and productivity. The second are the results from the scenario analysis, whereby projections of cost savings are made based on stipulated reductions in undernutrition. See specific questions under Policy Questions on the previous page.

Cost of Hunger Analysis

Health: In 2015, 3,272,889 undernourished children were ill with diarrhea, fever, respiratory infections, and/or anemia and adequate health care was received in only 45.2% of these cases. Furthermore, between 2011 and 2015, an estimated 211,611 child deaths were directly associated with undernutrition, accounting for 25.6% of infant mortality in that period. The COHA model also estimated that 60.2% of the working-age population (13,193,684 adults) suffered from chronic malnutrition before the age of five. Of the total working-age population, 10% of these adults (who would now be between 15 and 64 years of age) died due to undernutrition-related mortality. The COHA study estimated the total cost of undernutrition on health to be 7.23 billion MNZ (188.8 million USD), which equated to 1.28% of GDP at the time.

Education: The school repetition rate for undernourished children (in 2015) was 10%, compared with 4.1% for children who were not undernourished. Overall, 18.8% (209,728) of all school year repetitions in 2015 were associated with chronic malnutrition.

Students affected by undernutrition also attained fewer years of schooling than those who were not affected by undernutrition (see table at right), and lower educational outcomes would consequently impact the expected level of income that those children could achieve in adulthood. The COHA model estimated that 60.2% of the working-age population in Mozambique suffered from chronic childhood malnutrition.

In total, the COHA study estimated the cost of undernutrition on education to be 1.62 billion MZN (42.4 million USD), equating to .29% of the GDP. 56% of this cost was borne by the education system, with the remaining 44% borne by the families of affected students.

![Level of Education Attained](image-url)
**Productivity:** Of the 13,327,153 people in Mozambique who worked as manual laborers in 2015, 4,001,126 (4%) were estimated to be undernourished during childhood, representing a loss of potential annual income in excess of 5.2 billion MZN (134 million USD), and the equivalent to 3.3 % of Mozambique’s GDP at the time. The results also indicated that 612,816 non-manual workers suffered from chronic malnutrition during childhood, for an estimated annual productivity loss of 18 billion MZN (480 million USD), the equivalent to 0.9% of the GDP. Finally, an estimated 1,441,940 hours of work were estimated to be lost in 2015 due to the lack of labor force that resulted from infant mortality due to undernutrition. This represented a loss of 29.6 billion MZN (775.4 million USD), and 5.2% of the GDP. The total loss of productivity in 2015 due to the impact of child undernutrition was 53 billion (1.39 million USD) as per the COHA study, which equated to 9.4% of the GDP.

**Total Economic Impact:** The COHA analysis estimated that Mozambique lost approximately 62 billion MZN (1.7 billion USD) as a result of child undernutrition in 2015. These losses represent the cumulative impact of undernutrition on health, education and productivity (as described in the above sections) and would equate to approximately 10.94% of the GDP in 2015. Importantly, the largest share of this cost was derived from the loss of (potential) productivity that resulted from undernutrition-related mortality, i.e. adults that would have been productive in 2015, but that died from undernutrition-related illnesses as children.

### Scenario Analysis

The second aspect of the COHA analysis is a comparison of the baseline (‘do nothing’) scenario, against two scenarios in which significant programmatic efforts are made to reduce the prevalence of underweight and stunting over the next 10 years (i.e. between 2015 and 2025).

**Scenario #1:** In this scenario, the prevalence of underweight and chronically malnourished children would be reduced to half of the 2015 levels. This would translate to a steady reduction of 0.21 percentage points per year, in the prevalence of chronic malnutrition from 42.7% (in 2015) to 21.35% (in 2025). Such a reduction could lead to a decline of 60% in the total cost associated with undernutrition (see graph at right). The ‘cost savings’ associated with scenario #1 at net present value would be approximately 182.32 billion MNZ (4.76 billion USD).

**Scenario #2:** In this scenario, the prevalence of underweight would be reduced to 5% and the prevalence of stunting would be reduced 10% by 2025. As per the graph above, this would mean a significant reduction of 78% of the estimated total costs associated with undernutrition. The ‘cost savings’ associated with this scenario at net present value would be approximately 283 billion MNZ (7.39 billion USD).
Use of the Results

The primary use of these results has been advocacy efforts at national and sub-national levels in Mozambique. The Cost of Hunger estimate (1.7 billion USD and 11% of GDP) are regularly used by government and non-government representatives in meetings with government agencies and donors, and in the Mozambican press, to raise awareness that current levels of undernutrition are having significant financial consequences on the nation’s economy and that investment in reducing this undernutrition would lead to economic as well as human capital benefits.

The COHA study was a very important step in informing and supporting efforts to improve nutrition policy and programming in Mozambique. The finalization of the analysis came at a time when government finances and international investment in Mozambique were facing a period of instability due to a debt crisis. Having clear estimates of the cost of not continuing to prioritize nutrition through this period was very useful for nutrition advocates from government, NGOs and international organizations. While the COHA results do not provide guidance on the exact policy or programmatic activities needed or what their impact would be, they offer a rallying cry that echoes across organizations and sectors and clearly demands attention and action.

The COHA results were shared at a time when a number of strategic advocacy and planning efforts to update nutrition strategies and improve associated budgets were already underway. COHA’s power lies in the use of local evidence to convince or further convince decision-makers of the need to invest in nutrition. A good example of political achievement, as a result of COHA and these wider simultaneous actions, was the approval of the National Committee of Food Security and Nutrition (CONSAN, as abbreviated in Portuguese), which is led by the Prime Minister and is composed of a number of ministries. The CONSAN decree also approved the establishment of similar structures at provincial and district levels and, likewise, the restructuring of SETSAN to link it with CONSAN and give it a stronger mandate.

Lastly, the Scaling up Nutrition (SUN) Civic Society Platform has been using COHA key results in visibility materials disseminated as part of their advocacy campaign for improved nutrition. This campaign targets high-level decision makers across a range of stakeholder institutions.

Challenges to using COHA in Mozambique

There were a variety of challenges to implementing the COHA study in Mozambique:

Changes in staffing and leadership among stakeholders were a significant barrier to keeping a steady pace in terms of the analysis and dissemination. Turnover was experienced within government ministries and international partners that were involved in COHA. As a consequence, the COHA methodology had to be explained repeatedly to incoming participants, in order to ensure that stakeholders were on the same page, understood the methodology, and that the results would be readily accepted.
As is often the case, (and despite their interest and enthusiasm for the study), staff from many of the government and stakeholder agencies were already juggling too many projects and therefore had limited capacity to engage in the COHA exercise. As the process went on, a monthly update newsletter and presentation of results in different formats (events, report, summary and social media) did assist in a wider understanding and dissemination of results and uptake by partners in their work.

The requirement to follow the COHA reporting style applied internationally meant that some suggestions from national partners as to how to present results were not able to be acted upon. Some stakeholders shared that they felt that this limited the ability to provide background information on the context in Mozambique and modify the recommendations to make them more straightforward.

**Opportunities and Unexpected Benefits**

The COHA findings created the momentum and laid the foundation for engaging with the same partners to conduct a Fill the Nutrient Gap (FNG) study in Mozambique as a follow-on activity. The FNG study sought to continue the message of COHA, highlighting the cost that undernutrition has for the country, but then go into depth to diagnose some of the main reasons behind this undernutrition prevalence and explore what could be done to reduce it. The FNG was carried out between 2017 and 2018, and not only identified the barriers faced by the country’s most vulnerable to accessing and consuming nutritious diets, but it also tested the potential of various interventions aimed at improving access to those foods.

The process for applying the COHA methods through a detailed in-country process of stakeholder involvement and coordination set the scene for the FNG activities. A similar technical advisory group was formed with SETSAN leadership and the FNG was consultative and participatory.

**Acknowledgements**

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