ສະຫະພາບ ເອີຣົບ
European Union

unicef
for every child

# POLICY BRIEF

# ECONOMIC CONSEQUENCES OF MALNUTRITION IN LAO PDR

The link between nutrition and economic development is evident and the loss of productivity due to malnutrition is still a big challenge for economic development in Lao PDR. In 2013, the National Institute for Economic Research (NIER) carried out the first micro-simulation analysis on economic consequences of malnutrition in Lao PDR with the support of UNICEF. The overall objective of the assessment was to show how and how much malnutrition affects the Lao economy. This was done by using the most recent available data and investigate trends since the last assessment was conducted in 2013 and thus to attract nutrition policy attention and discussions.

For this analysis a proven methodology was used focusing on four pathways to economic damage:

- Lost workforce due to mortality of children
- Losses of future productivity and potential earnings of malnourished children 6-24 months
- Loss of current value of reduced productivity in working adults
- Value of excess and preventable healthcare cost.

The financial burden and cost of malnutrition in Lao PDR for each of the four pathways in 2013 and 2020 compared are:

| | Nutrition indicators | Health issues | Losses | Value of Losses | 2013 | 2020 |
|---|---|---|---|---|---|---|
| PATHWAY 1 | Underweight<br>Low birth weight<br>Anemia in pregnancy<br>Sub-optimal breastfeeding<br>Vitamin A deficiency<br>Birth defects | CHILD MORTALITY RISK | Lost future workforce | Estimated (US$ M/Y) | 194.10 | 116.56 |
| | | | | % to GDP | 1.64% | 0.64% |
| PATHWAY 2 | Childhood stunting<br>Anemia in children | CHILD COGNITIVE & GROWTH DEFECTS | Lost future productivity | Estimated (US$ M/Y) | 168.50 | 212.26 |
| | | | | % to GDP | 1.43% | 1.17% |
| PATHWAY 3 | Adult anemia | ADULT WORK DEFICIT | Lost current productivity | Estimated (US$ M/Y) | 82.00 | 150.95 |
| | | | | % to GDP | 0.69% | 0.83% |
| PATHWAY 4 | Sub-optimal breastfeeding<br>Low birth weight | CHILD MORBIDITY | Excess preventable healthcare cost | Estimated (US$ M/Y) | 2.80 | 1.89 |
| | | | | % to GDP | 0.02% | 0.01% |

| | 2013 | 2020 |
|---|---|---|
| **Total % to GDP** | **3.78%** | **2.66%** |

Since 2013 there has been a decrease in the total loss of GDP from 3.78% to 2.66% in 2020. The biggest burden of economic loss is attributable to anaemia in children and women of reproductive age, accounting for half of the total economic loss or 241.7 million USD in 2020. In 2020, 1.8 million people were estimated to be malnourished in Lao PDR.

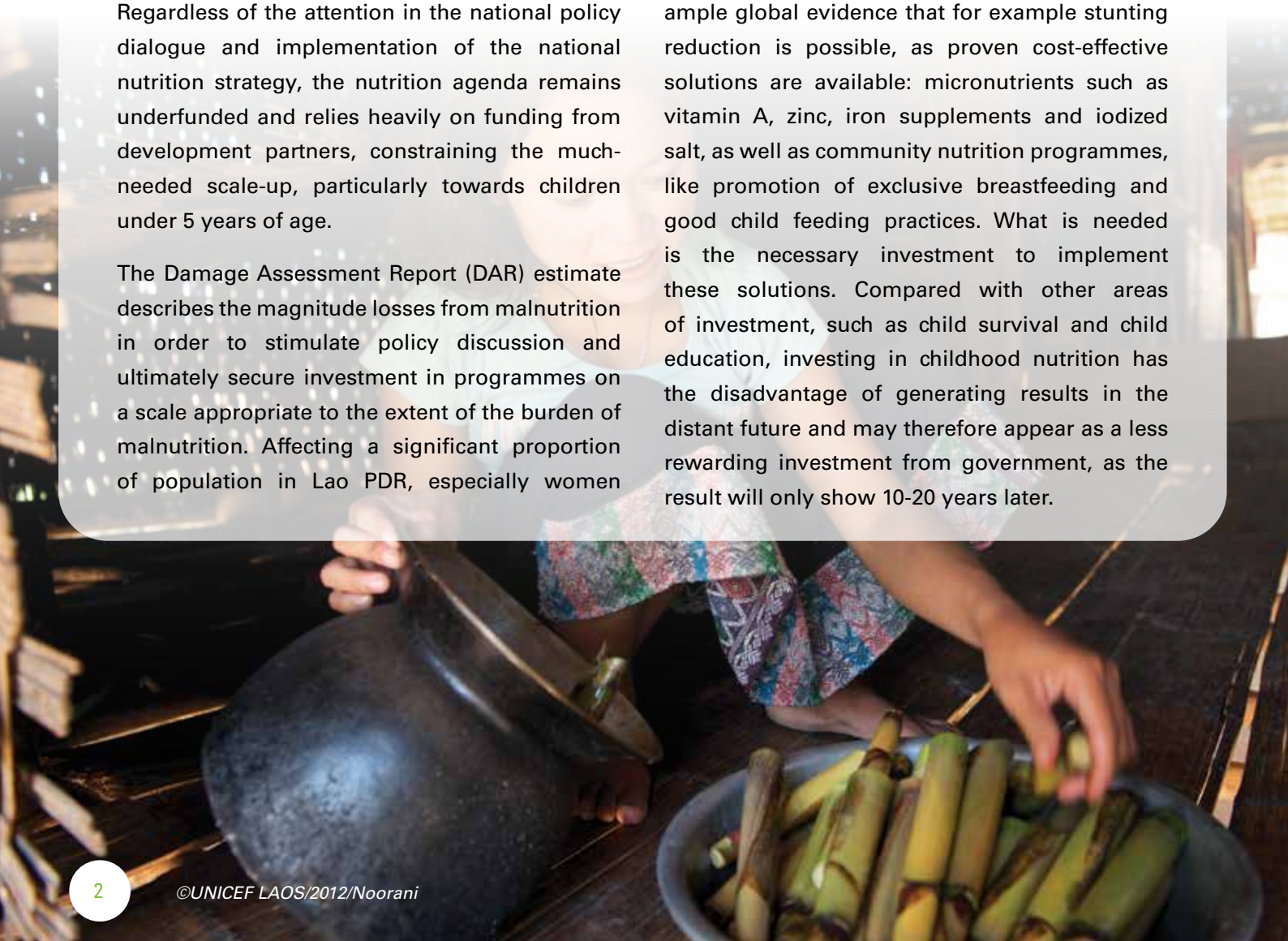
The assessment has showed that Lao PDR was losing approximately 481.66 million USD in 2020 due to malnutrition. To reduce the economic loss, it is key to link with other sectors such as education, agriculture, sanitation to address malnutrition through further nutrition specific and nutrition sensitive interventions. These need to be implemented in a synergetic and cost-effective way. Through joint interventions and effort Lao PDR can develop healthier citizens and a healthy labour force which will increase economic development.

Regardless of the attention in the national policy dialogue and implementation of the national nutrition strategy, the nutrition agenda remains underfunded and relies heavily on funding from development partners, constraining the much-needed scale-up, particularly towards children under 5 years of age.

The Damage Assessment Report (DAR) estimate describes the magnitude losses from malnutrition in order to stimulate policy discussion and ultimately secure investment in programmes on a scale appropriate to the extent of the burden of malnutrition. Affecting a significant proportion of population in Lao PDR, especially women and children, the economic burden emerging from undernutrition has a negative impact on the Lao economy. Undernutrition erodes the human capital that lays the foundation of economic growth: people's strength and energy, creative and analytical capacity, and initiative and entrepreneurial drive.

In order to reduce the malnutrition rate in the country, several actions must be taken to improve the nutritional situation, these include: reduction of stunting and wasting, reduction of low birth weight, increase appropriate feeding practices during pregnancy and in children under 5 years of age. Furthermore, increased access to adequate sanitation and addressing water, sanitation and hygiene (WASH) intervention implementation, otherwise this could have a negative impact on efforts to reduce malnutrition.

Good nutrition is the foundation of a child's survival, health and development. There is ample global evidence that for example stunting reduction is possible, as proven cost-effective solutions are available: micronutrients such as vitamin A, zinc, iron supplements and iodized salt, as well as community nutrition programmes, like promotion of exclusive breastfeeding and good child feeding practices. What is needed is the necessary investment to implement these solutions. Compared with other areas of investment, such as child survival and child education, investing in childhood nutrition has the disadvantage of generating results in the distant future and may therefore appear as a less rewarding investment from government, as the result will only show 10-20 years later.



*©UNICEF LAOS/2012/Noorani*

# Approach and methodology

The objective of the 2020 update was to estimate the economic burden of malnutrition in Lao PDR using the most recent data and investigate trends since the last assessment in 2013.

The objective of the analysis was to:

- ✓ Assess the economic loss due to malnutrition in Lao PDR
- ✓ To identify key intervention areas that require increased attention by nutrition stakeholders

The analysis was largely based on the data of Lao Social Indicator Survey (LSIS) 1, 2011-2012 and on LSIS 2, 2017. Where data has not available from both surveys, alternate sources from global sources were used.[1]

The analysis has used the consequence model by applying the coefficients of losses established in the global scientific literature to the Lao context. It used health, demographic and economic data to develop a national DAR. DAR is an estimate of the magnitude of the national burden emerging from seven indicators as the basis for calculations to estimate the economic impact of undernutrition. The seven indicators are: underweight, stunting, low birth weight (under 1 month), anaemia, sub-optimal breastfeeding, vitamin A deficiency and birth defects.

## Malnutrition and the economic situation in Lao PDR

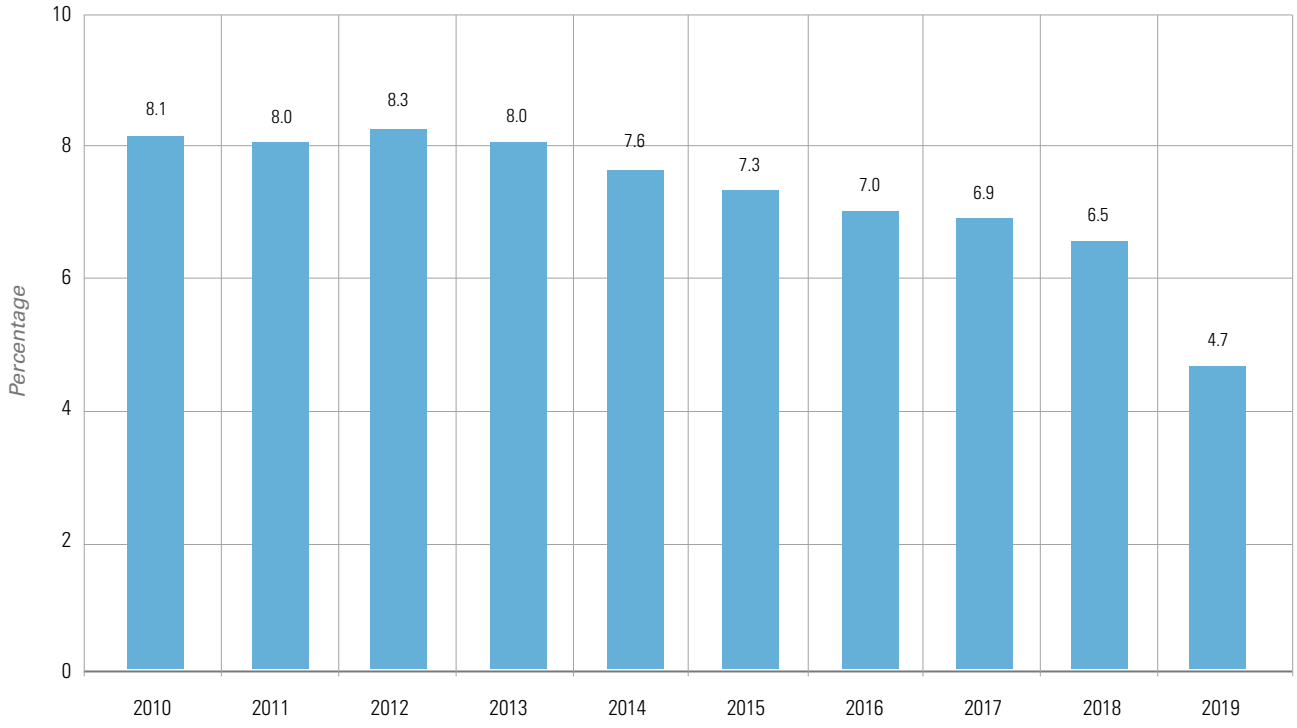
Since 2000 there has been extensive focus on malnutrition in Lao PDR by the Government of Lao PDR and development partners with support going into nutrition programming and interventions. Over the years, there has been increased funding from key development partners such as the European Union, World Bank, United Nations, USAID among others with prioritized programmes and awareness raising on malnutrition and the impacts of malnutrition. This has resulted in a reduction in stunting from 48.2% in 2000 to 33% in 2017 and underweight from 36.4% to 21.1% in the same period. Country stakeholders are however concerned that the nutrition results are not commensurate with the investments so far.

Malnutrition is the biggest threat to a child's health and undernutrition is one of the main causes of death. Unlike starvation it is can be difficult to see if a child is malnourished when it suffers from milder forms of malnutrition. The first 1000 days of a child's life – from pregnancy to the child's second birthday are vital for the cognitive and linear growth of the child. In fact, it is during this period that the brain development occurs and any physiological deficiency during this period can lead to both short- and long-term consequences.[2, 3] Malnutrition threatens lives and national socioeconomic development, is associated with reduced school enrolment, poses a challenge to the attainment of education targets, and has an impact on development and economic growth in later years.

Good nutrition is important for cognitive development in the first 1,000 days of a child's life. Stunting is an indicator of cognitive capability and life potential and children born in Lao PDR today can expect to be only 45% as productive compared to those who benefit from optimal nutrition and education. A study conducted in four provinces in Lao PDR found that only 44% of pregnant women reached a minimum dietary diversity, while 10% ate fewer than three meals a day.[4] Malnutrition leads to enormous economic and human costs in Lao PDR. Data from LSIS 2 suggest 1.8 million Lao citizens, mainly women and children, suffer from some form of malnutrition and cannot achieve their full development potential as students, workers and parents resulting in negative effects on overall human capital of the country. This is an increase since 2013, where the number of malnourished people was 1.7 million people.[5]

Over the past decade Lao PDR has experienced rapid economic growth as illustrated in graph 1 below, however this has not resulted in same proportion of poverty reduction. The growth is mainly a result of megaprojects in the natural resource sector, which has created limited employment opportunities and has not been particularly inclusive for the population in Lao PDR.[6]

*Graph 1:* Annual growth rate of real GDP, Lao PDR




*Source: Tradingeconomic.com, The Bank of Lao PDR*

Lao PDR has reduced its poverty rate from 24.6% in 2013 to 18.3% in 2019. Average GDP per capital is 2,535 USD, which is an increase of 709 USD from 1,826 USD per capita in 2013, whereas GINI co-efficient is 38.8% (2020). Approximately 9% of the population in Lao PDR today lives on less than USD 1.90 per day, which was a decline from 15.6% in 2012/2013. The rate of poverty reduction has been rapid in rural areas, while urban poverty reduction has stagnated. Savannakhet (20.6%), Oudomxay (8.7%), Khammouane (8.3%), Saravane (8%) and Luangprabang (7.7%) provinces account for more than half of the poor in Lao PDR. Poverty is concentrated among minority ethnic groups and people with low formal education level with the Hmong-Iumien ethnic group having the highest level of poverty 38.4% compared to national level at 18.3%.[7, 8,9]

Primary education completion rates have improved from 77.9% (female 79.1%) in 2015/16 to 79.9% with completion rates of girls at 82.7% in 2019-20, higher than that of boys in 2020, but still 20% of the enrolled children do not complete and drop out before they have completed their primary education. It is difficult to reach children from poor families living in remote areas often with long distances to the nearest school and often they do not speak Lao language, which is the official language of instruction and they are therefore not able to understand the curriculum. 7.5% of youth aged between 15 -24 years are illiterate, 9.5% women and 5.6% men.[10]

# Analysis of four pathways to economic damage

The analysis of consequences of malnutrition for Lao PDR is based on the following seven indicators of malnutrition: underweight, stunting, low birth weight, sub-optimal breastfeeding, anaemia, vitamin A deficiency and birth defects. These are formulated into four pathways to economic damage.

The four pathways are:

- Lost workforce due to mortality of children
- Losses of future productivity and potential earnings of malnourished children 6-24 months
- Loss of current value of reduced productivity in working adults
- Value of excess and preventable healthcare cost.

## Pathway #1 Lost future workforce due to child mortality

The scale of child mortality caused by malnutrition is hidden in a negative synergy of malnutrition, infection, disease and premature death of children. Malnutrition is rarely listed as cause of death. Estimating the national impact of malnutrition on child mortality is based on current rates of child death: 46 children under 5 years of age of death, 40 infant deaths per 1,000 live births, 24 stillbirths and 18 neonatal deaths for 1,000 live births. The number of child deaths was 12,339 in 2013, whereas 6,373 children died before their 5th birthday in 2020.[11,12]

The first pathway estimates the value of lost future workforce due to child mortality. This value is simply derived as a future lost workforce—by taking a discounted net present value (NPV) of future lost earnings. The estimate is measured across six indicators: 1) underweight, 2) low birth weight (under 1 month), 3) perinatal mortality attributed to anaemia in pregnancy, 4) sub-optimal breastfeeding, 5) vitamin A deficiency and 6) birth defects.

Calculations estimate the value of future lost earnings caused by child mortality to be 116.6 million USD in 2020, which is a reduction of 77.5 million USD compared to 2013.

## Pathway #2 Losses of future productivity and potential earnings of malnourished children 6-24 months

The second pathway looks into losses of future productivity and potential earnings of malnourished children 6-24 months. It focuses on child anaemia and stunting indicators, these indicators are associated with slow growth, reduced cognition, suboptimal school performance and reduced adult earnings.

Stunting has an effect on physical growth, strength and the cognitive development of a child. Malnourished children will score low on cognitive tests, psychomotor development, and fine motor skills. These early childhood deficits will, to a large extent, determine educational outcomes and later employment opportunities, and can result in an adult productivity deficit and NPV of loss. Together cognitive development and physical growth will improve school performance, which will result in a higher productivity, when the child becomes an adult and active member of workforce. Studies show that wages rise by 1.3% for every 1.0% increase in height. Severe stunting represents 6.2% reduction in height, which equals to 8.6% future earnings deficit, whereas moderate stunting represents a 4.3% reduction in height which equal to 6.0% earnings deficit.[13]

Since 2013 the number of children between 6–23 months with anaemia has increased with 15,789 children causing an estimated economic loss of 77.3 million USD. NPV of future productive potential loss due to child anaemia and stunting in 2020 was 135 million USD, this is an increase of 44.3 million USD since 2013.

## Pathway #3 Impact of anaemia on adult productivity

Reduced level of productivity has an enormous impact on the Lao economy and the economic burden of lost productivity among anaemic adults working in agriculture, industry and other employment manual labour.

Since 2013 there has been an increase in the national prevalence of anaemia in the Lao workforce. In particular, the number of women of reproductive age suffering from anaemia has increased by 8% or an additional 277,496 women are anaemic resulting in a total of one million women. This increased number might also reflect that more women have joined the workforce.

Weakness and fatigue brought on by anaemia result in measurable productivity deficits in manual labour due to lower performance. With 55.6% or 1.27 million workers of the total workforce suffering from iron deficits, this has a big impact on the productivity. An estimate suggests a 5% in deficit among all manual labour and an additional 12% loss for heavy manual labour such as agriculture, manufacturing and construction due to lower productivity and energy levels.

The economic loss due to reduced levels of productivity caused by anaemia in adults adds up to an annual cost of 151 million USD in 2020. This is a significant increase of the burden compared to 2013, where the economic loss was 82 million USD per year.

## Pathway #4 Financial burden on health care system

The last pathway focuses on the financial burden on the health care system. This pathway assesses the increase of healthcare expenditure due to poor breastfeeding, low birth weight, diarrhoea and Acute Respiratory Infection (ARI).

The cost related to treatment of diarrhoea and ARI has decreased since 2013. For diarrhoea the number of attributed cases has decreased with 98,636 cases in total, whereas attributed ARI cases have decreased by 43,147 cases from 2013 to 2020. Not all cases result in health care seeking and only the proportion of cases actually seeking care or receiving medical services are counted as a cost. For ARI, utilization of health care services is based on the percentage of cases seen in public or private health care facilities along with the proportion receiving medication. For diarrhoea, LSIS data defines the proportion of cases receiving specific treatments.

The current value of excess and preventable healthcare utilization due to suboptimal breastfeeding, and low birthweight was around 1.89 million USD in 2020. This is a reduction since 2013 of almost one million USD. The highest cost is related to sub-optimal breastfeeding.

*©UNICEF LAOS/2021/Saykoson*

# Summary and conclusion of economic damage for all indicators and four pathways

This analysis has calculated the economic burden of malnutrition based on seven key nutrition indicators for Lao PDR. The analysis has shown that Lao PDR in 2020 was losing approximately 481.66 million USD due to malnutrition, in particularly stunting and anaemia. 1.8 million people are malnourished in Lao PDR.

In the table below the four pathways are summarised for 2013 and 2020, respectively. When comparing the numbers from 2013 and 2020, there has been a decrease in the total loss of GDP of 1.12 percentage point from 3.78% to 2.66%, however the total cost has increased with 35.16 million USD during the past seven years.

The biggest burden of economic loss in Lao PDR 2020 is caused by anaemia in children and women in their reproductive age as well as in the labour force accounting for over half of the total economic loss or 241.7 million USD in 2020.

*Table 1* Summary of four pathways 2013

| ESTIMATED 2013 | LOSS OF FUTURE PRODUCTIVITY | REDUCING FUTURE PRODUCTIVITY | REDUCING CURRENT PRODUCTIVITY | EXCESS HEALTH CARE COST | TOTAL | PERCENT (%) |
|---|---|---|---|---|---|---|
| Underweight | 85.7 | | | | 85.7 | 19.2% |
| Stunting | | 122.2 | | | 122.2 | 27.4% |
| Low birth weight | 11.3 | | | 0.6 | 11.9 | 2.7% |
| Anaemia | 15.3 | 46.3 | 82.0 | | 143.6 | 32.2% |
| Vitamin A deficiency | 20.5 | | | | 20.5 | 4.6% |
| Sub-optimal breastfeeding | 55.8 | | | 1.3 | 57.0 | 12.8% |
| Birth defects (neural tube defects) | 5.4 | | | | 5.4 | 1.2% |
| Total | 194.1 | 168.5 | 82.0 | 2.8 | 446.5 | 100% |
| Percentage to GDP | 1.64% | 1.43% | 0.69% | 0.02% | 3.78% | |

*Table 2* Summary of four pathways 2020

| ESTIMATED 2020 | LOSS OF FUTURE PRODUCTIVITY | REDUCING FUTURE PRODUCTIVITY | REDUCING CURRENT PRODUCTIVITY | EXCESS HEALTH CARE COST | TOTAL | PERCENT (%) |
|---|---|---|---|---|---|---|
| Underweight | 42.39 | | | | 42.4 | 8.8% |
| Stunting | | 135.00 | | | 135.0 | 28.0% |
| Low birth weight | 11.57 | | | 0.62 | 12.2 | 2.5% |
| Anaemia | 13.49 | 77.26 | 150.95 | | 241.7 | 50.2% |
| Vitamin A deficiency | 9.89 | | | | 9.9 | 2.1% |
| Sub-optimal breastfeeding | 32.63 | | | 1.27 | 33.9 | 7.0% |
| Birth defects (neural tube defects) | 6.59 | | | | 6.6 | 1.4% |
| Total | 116.56 | 212.26 | 150.95 | 1.89 | 481.7 | 100% |
| Percentage to GDP | | 1.17% | 0.83% | 0.01% | 2.66% | |

©UNICEF LAOS/2021/Saykoson

Economic losses are concentrated among the youngest children which accounts for 330.71 million USD or three out of four pathways. 90% of childhood loss comes from prenatal and below 24 months period. 28% of the economic loss in Lao PDR is linked to stunting. Stunting is one of the most significant obstacles to human development. If the goal of 25% stunting rate as set forward in the National Nutrition Strategy is to be reached, Lao PDR must reduce the annual loss caused by stunting. Currently Lao PDR is experiencing a yearly loss of approximately 135 million USD. This is actually an increase from 2013, despite the stunting rate having been reduced, the economic loss has increased with 13 million USD.

The assessment has shown that Lao PDR was losing approximately 481.66 million USD in 2020 due to malnutrition. To reduce the economic loss, it is key to link with other sectors such as education, agriculture, and sanitation to address malnutrition through further nutrition specific and nutrition sensitive interventions. These must be implemented in in a synergetic and cost-effective way. Through joint interventions and effort Lao PDR can develop healthier citizens and a healthy labour force which will increase economic development.

Affecting a significant portion of population in Lao PDR, especially women and children, the economic burden emerging from undernutrition has a negative impact on the Lao economy. Undernutrition erodes the human capital that lays the foundation of economic growth: people's strength and energy, creative and analytical capacity, and initiative and entrepreneurial drive.

The DAR estimate describes the magnitude losses from malnutrition in order to stimulate policy discussion and ultimately secure investment in programmes on a scale appropriate to the extent of the burden of malnutrition. The baseline losses projected by the DAR indicate the potential for significant economic as well as human and social benefits that might be secured by investment in interventions to lower the prevalence of these indicators of malnutrition.

# Recommendations

The current generation of children in Lao PDR is the backbone of the future economic growth and social development of Lao PDR. Therefore, timely and strategic investments in children will maximise the cognitive and human capital of Lao PDR's generation 2030, who will drive the development of Lao PDR and achieve the SDGs. Reducing malnutrition among children in the country will contribute enormously towards the economic growth and overall productivity level of the country for a better and more prosperous Lao PDR.

In order to reduce the malnutrition rate in the country, several actions must be taken to improve the nutritional situation, these include: reduction of wasting, reduction of low birth weight, increase appropriate feeding practices during pregnancy and in children under 5 years of age. Furthermore, increased access to WASH interventions could impact on stunting reduction efforts.

The assessment does not suggest easy ways for addressing those two nutrition problems, but it suggests and urges the government of Lao PDR to undertake a thorough review of its current policies and directives to assess if they are addressing malnutrition in the most optimal way. The government of Lao PDR should rapidly expand a range of low-cost effective nutrition interventions to break the current cycle of increased mortality, poor health and ultimately lower work performance, productivity and earnings.


©UNICEF LAOS

## References


1 Population and housing census, LSB; LECS6; World Bank; UNICEF; NIER & UNICEF; UN Inter-agency Group for Child Mortality Estimation
2 Repositioning Nutrition as Central to Development A Strategy for Large-Scale Action, WB 2006
3 Prevalence and Socio-economic Impacts of Malnutrition Among Children in Uganda, Nutrition and Metabolic Insights Volume 12: 1–5, 2019, Adebisi et al
4 Maternal Nutrition Brief, UNICEF 2019, Vientiane, Lao PDR.
5 The Economic Consequences of Malnutrition in Lao PDR, National Economic Research Institute, Ministry of Planning and Investment, UNICEF, 2013, Vientiane, Lao PDR.
6 World Bank report Health and Nutrition Services Access Project
7 Key findings from the Lao Expenditure and Consumption Survey (LECS VI) 2018/2019, Vientiane, Lao PDR.
8 Health and Nutrition Services Access Project, World Bank, 2020
9 Lao Social Indicator Survey 2 (LSIS2) 2017, Government of Lao PDR, UNICEF, Vientiane, Lao PDR.
10 Ministry of Education and Sports 2020, Education and Sports Sector Development Plan 2021-2025, Vientiane, Lao PDR
11 Lao Social Indicator Survey (LSIS 1),2013, LSB, Government of Lao PDR, UNICEF, Vientiane, Lao PDR.
12 Lao Social Indicator Survey 2 (LSIS2) 2017, Government of Lao PDR, UNICEF, Vientiane, Lao PDR.
13 The Economic Consequences of Malnutrition in Lao PDR, National Economic Research Institute, Ministry of Planning and Investment, UNICEF, 2013, Vientiane, Lao PDR.


## ACKNOWLEDGEMENT


We acknowledge the financial and technical contributions of the European Union and UNICEF in conducting this secondary analysis as part of the National Information Platform for Nutrition (NIPN) initiative.

**Special thanks go to staff of:**

**Center for Socio-Economic Science and Policy Research, National Institute for Economic Research**

- **Dr. Saykham Voladet** - Acting Director General
- **Mr. Khamnang Kounpakdee** - Deputy Chief of Division
- **Ms. Mali Sengkhamyong** - Technical Officer

**NIPN Policy Analysis Unit**

- **Ms. Anne Christa Nielsen** – International Policy Analysis Advisor
- **Ms. Pany Sananikhom** – National Policy Consultant

**Center for Socio-Economic Science and Policy Research, National Institute for Economic Research**

**Lao PDR**

**December, 2021**

NiPN
National Information Platforms for Nutrition

## Disclaimer

"This publication has been produced with assistance of the European Union. The contents of this publication are the sole responsibility of the Center for Socio-Economic Science and Policy Research, National Institute for Economic Research, Lao PDR and UNICEF and can in no way be taken to reflect the views of the European Union"

For more information, please visit: https://nipn.lsb.gov.la/