WHEN IT MATTERS MOST

Improving nutrition and survival for the youngest and most vulnerable children

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Lead Authors: Andreas Hasman, Grainne Moloney and Víctor Aguayo (UNICEF).

Research group: Rockli Kim (Korea University, South Korea), Omar Karlson (Duke University, USA and Lund University, Sweden) and Subu V. Subramanian (Harvard University, USA).

Technical contributors: Annette Imohe, Minh Tram Le, Fatmata Fatima Sesay, Linda Shaker (UNICEF)

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Our challenge: Reaching the children most at risk of dying too young

The world has made remarkable progress in improving child survival over the past three decades. Both the under-five mortality rate and the number of under-five deaths have fallen by almost 60 per cent since 1990.[1] These global efforts to reduce mortality are averting more child deaths than ever before and contributing towards a future where all children realize their right to survive, grow and develop to their full potential.

Despite this considerable progress, just under 5 million children under 5 years of age still die every year, mostly due to preventable causes – an intolerably high number of child deaths that are largely preventable.[1] The distribution of these child deaths is highly inequitable: almost 2 million occur annually in the 47 countries that the United Nations describes as 'least developed' – 33 times more than the 60,000 annual deaths in high-income countries.[2]

Millions of children suffer the consequences of early childhood malnutrition

Each ● represents 50,000 children

Nutrition and child mortality

Undernutrition and infection are primary causes of death among children under 5. Separating such deaths can be challenging – infection can cause undernutrition and undernutrition can weaken immune response, making a child more susceptible to and more likely to die from infection.

While the annual rate of reduction in child mortality has improved since the 1990s, current progress is too slow to achieve the Sustainable Development Goal (SDG) 3 target of an end to preventable deaths of newborns and children under 5 years of age by 2030. If this trend continues, about 40 million children under 5 will die before 2030, more than half of them in sub-Saharan Africa.[3]

What can be done to accelerate progress – and how can child nutrition programmes contribute?

Child hunger and malnutrition are violations of children's rights. They are also significant contributors to mortality, causing an estimated 45 per cent of all deaths in children under 5 years of age.[4] Every year, approximately 800,000 child deaths are attributable to wasting (60 per cent of these are associated with severe wasting), and more than 1 million deaths are attributable to stunting. Children suffering from both wasting and stunting have a particularly high risk of death.[5] The links between child undernutrition and mortality make clear that global efforts to protect survival must be linked with efforts to uphold children's rights to nutrition and development.

Children who receive the right foods, nutrition services and feeding and care practices at the right time in their development – particularly during the first two years of life – are more likely to survive, grow and develop to their full potential. Yet today, far too many children are failing to survive and thrive because they are missing out on key interventions to prevent stunting and wasting and ensure life-saving early detection and treatment when prevention falls short.

The coverage of key nutrition interventions is also highly inequitable: children missed with one nutrition intervention are typically also deprived of other nutrition and health interventions, compounding mortality risks. This means that to accelerate reductions in child mortality, we need to find better strategies for reaching the most vulnerable children: those who are at greatest risk of dying.

Child nutrition programmes have the power to save lives and make substantial contributions to the prevention and treatment of malnutrition. However, many of these programmes lack the resources needed to optimize their impact – at a time when needs have never been greater. The combined impacts of economic downturn, increasing inequities, large-scale epidemics, severe climatic events, protracted conflict and the ensuing global food and nutrition crisis have exacerbated the risk of child malnutrition in low- and middle-income countries and caused resource needs to soar.

According to the Global Nutrition Report, the financing needed to reach the four global targets for maternal and child nutrition* has increased from US$7 billion a year (for 2016–2025) to US$10.8 billion a year, from now until 2030.[6] Official development assistance from private donors for nutrition interventions has stagnated, while an analysis across 118 lower-middle income countries revealed declines in government spending that are likely to continue until the end of the decade. The imbalance in financing for humanitarian crises versus non-emergency contexts is also an ongoing challenge. For example, funding to address child wasting is typically earmarked for emergency response; however, most children with wasting live in non-emergency contexts.

* The four global nutrition targets include: 1) stunting in children under 5 years of age, 2) wasting in children under 5 years of age, 3) anaemia in women of reproductive age, and 4) breastfeeding.

Under resource constraints, nutrition programmes must seek to better utilize available data to identify and prioritize those most in need. Biochemical data can provide insights into which areas have the highest prevalence of stunting, wasting, micronutrient deficiencies, and insufficient diets. Such data are typically expensive to collect and surveys are often insufficiently frequent to be used for planning, real-time correction and monitoring. Disadvantaged children typically experience multiple deprivations, and child malnutrition closely correlates with other indicators of deprivation, such as poverty and incomplete vaccination. But due to logistical and resource constraints, such 'indirect' data on nutritional risks have rarely been used to optimize the delivery of child nutrition programmes to reach the children who stand to benefit most.

These challenges raise pressing questions for UNICEF and its global nutrition partners: In the context of severe resource constraints, increased needs and data limitations, how can nutrition programmes be designed to avert the greatest number of child deaths and have the largest possible nutrition impact on children? And what strategies can be leveraged to improve coverage and prioritize the children or population groups most likely to die or become undernourished before their fifth birthday?

Our research: Are the youngest children most at risk of mortality and malnutrition?

UNICEF set out to answer these questions by embarking on a series of research papers together with Korea University and Harvard University. Guided by the evidence that the first two years of life are the greatest period of child growth and neurodevelopment, and the period where

interventions to prevent malnutrition have the greatest opportunity for impact, UNICEF, Korea University and Harvard University sought to determine the extent to which under-five mortality and associated nutritional risks are also concentrated in children under 2 years of age. In addition to undertaking new research, we also examined the existing literature to complement and expand our findings.

Our objective in undertaking this research was to determine whether age prioritization could ultimately be used as a strategy for increasing the equitable coverage of nutrition interventions and averting child deaths in the context of limited resources and data scarcity.

Research studies were undertaken on four topics: child mortality, stunting, wasting, and access to key nutrition services and dietary practices. These studies aimed to generate evidence that would help us determine whether prioritizing nutrition programmes in the first two years of life could save more children's lives and support a wide range of health and development benefits.

The first study examined under-five mortality across 77 low- and middle-income countries to determine the share of child deaths occurring before 2 years of age.[7] The second study estimated the age distribution of child wasting prevalence by comparing children under 2 years of age with children over 2 years of age, using data from Demographic and Health Surveys and Multiple Indicator Cluster Surveys from 94 countries.[8] The third study estimated the relationship between stunting prevalence and age in 94 low- and middle-income countries.[9] The fourth study estimated the percentage of children aged 6–23 months receiving the minimum dietary diversity, vitamin A-rich foods, and vitamin A supplementation. It also estimated the difference in the proportion of children under 2 years of age and over 2 years of age receiving vitamin A supplementation using nationally representative cross-sectional household surveys in 51 low- and middle-income countries.[10]

Our report: What it includes and who it is intended for

This report provides an overview of the findings of the four research studies conducted by UNICEF, Korea University and Harvard University on the extent to which under-five mortality, stunting and wasting are concentrated in children under 2 years of age. We examine the programmatic implications of our findings and explore how they can be used to maximize the coverage of interventions to prevent and treat malnutrition in contexts where resources and data are inadequate to reach all children under 5 years of age. Finally, we offer recommendations for how these findings can be used to guide programmatic decision-making in ways that avert the greatest number of child deaths and reach the children most at risk.

The report is intended to support UNICEF country offices and their partners in designing, implementing and monitoring child nutrition programmes with the goal of achieving the greatest impact in the context of resource constraints and data limitations.

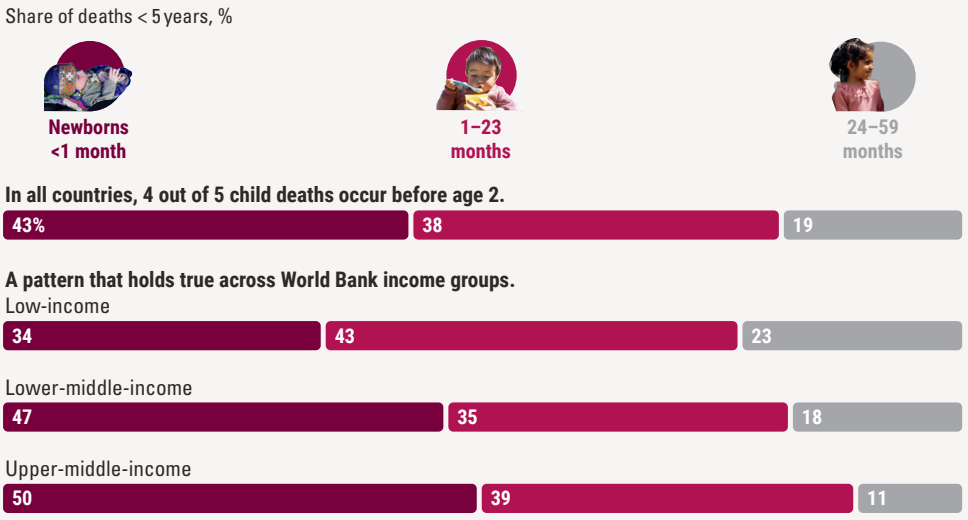
Our findings: The peril and promise of the first two years of life

This section describes key findings of the research undertaken by UNICEF and its partners. Our findings illustrate how the risks of both mortality and malnutrition are greatest among the youngest children – those under the age of 2 years. They also demonstrate that the most vulnerable children are facing multiple deprivations that are putting them at increased risk.

Finding 1. Mortality is concentrated among children under 2 years of age

Our research finds that in all countries, more child deaths occur before 2 years of age than at any other time in childhood. More than four out of five child deaths – 81.5 per cent – occur before the age of 2 years. Of these early deaths, about half occur after the neonatal period. This is based on our cross-sectional study of 2.8 million children younger than 5 years of age from 77 countries.[7]

More deaths occur before age 2 than at any other time in childhood.
In all countries and in all households, more deaths occur before age 2 than after.



Source: UNICEF global databases, 2020–2022.

In all countries, the proportion of deaths in the youngest children increases with lower overall under-five mortality. The lowest share of deaths occurring before 2 years of age is in the Niger (under-five mortality rate of 153 deaths per 1,000 live births), where 64 per cent of child deaths are in children under 2 years of age. The highest proportion of deaths before 2 years of age is in Albania (under-five mortality rate of 5.8 deaths per 1,000 live births), where 98 per cent of deaths are in the youngest children. In other words, the lower child mortality a country has, the greater the share of deaths occurring before age 2, and the more mortality is concentrated in the youngest children. The same pattern is seen within countries: because under-five mortality

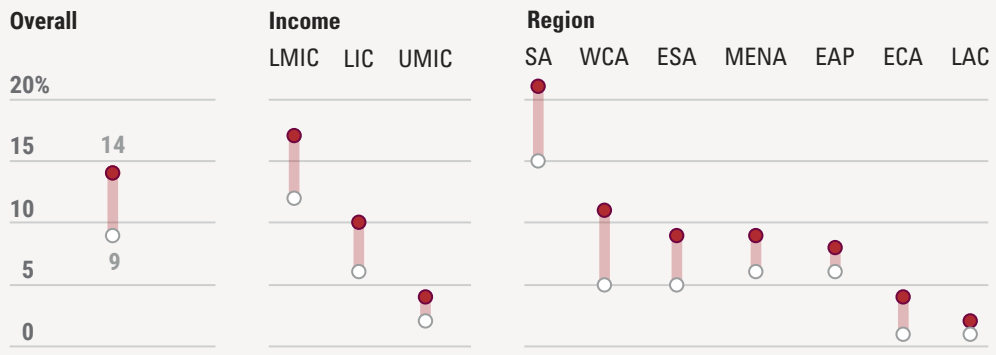
is higher in poorer households, the proportion of under-five deaths occurring before age 2 is smaller in the poorest households than in wealthier households. However, in all countries and in all households, more deaths occur before 2 years of age than after age 2 years.

Separating deaths caused by undernutrition from those caused by infections is challenging. Infections can cause undernutrition by restricting the absorption of nutrients, increasing energy requirements to fight off infections and reducing appetite. At the same time, undernutrition can cause infection, as undernourished children have weakened immune systems, making them more susceptible to infections and more likely to die of them.[7]

A central conclusion from these findings is that, when resources are limited and all children cannot be reached, there is an opportunity for nutrition and health programmes to optimize survival by prioritizing children under the age of 2 years.

Finding 2. Stunting and wasting are concentrated in children under 2 years of age

Our research finds that children under 2 years of age are more at risk of stunting (low height-for-age) and wasting (low weight-for-height) than any other age group. This finding holds true in both the poorest and richest countries.[8]



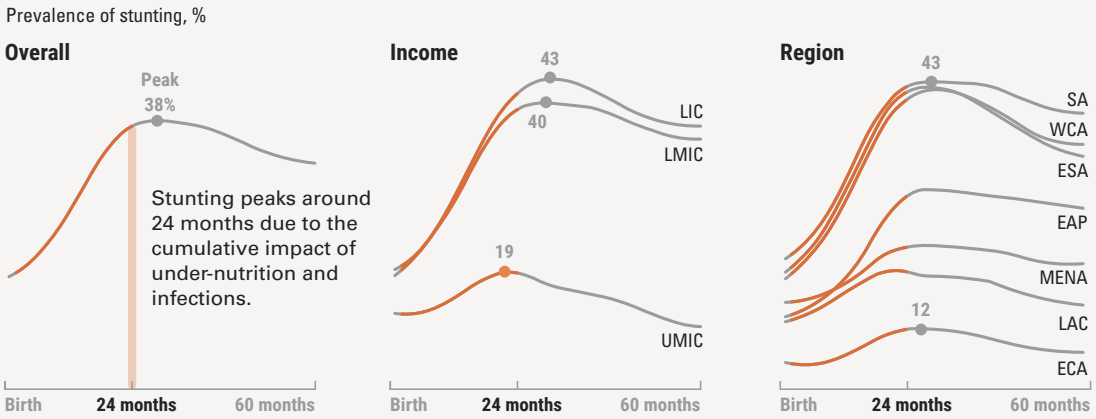
EAP: East Asia and Pacific; **ECA:** Europe and Central Asia; **ESA:** Eastern and Southern Africa; **LAC:** Latin America and Caribbean; **LIC:** low-income country; **LMIC:** lower-middle-income country; **MENA:** Middle East and North Africa; **SA:** South Asia; **UMIC:** upper-middle-income country; **WCA:** West and Central Africa.

Modified from: Karlsson, O., Kim, R., Guerrero, S., Hasman, A., & Subramanian, S. V. (2022). Child wasting before and after age two years: A cross-sectional study of 94 countries. *EClinicalMedicine, 46,* 101353.

Wasting refers to recent weight loss from lack of nutrient intake and/or illness; it can also be the result of a persistent inability to gain weight at a healthy rate. In its most severe form, wasting increases children's risk of mortality and jeopardizes their physical growth and brain development. In our sample of 94 low- and middle-income countries, the prevalence of child wasting was more than 50 per cent higher in children under 2 than in children 2–4 years of age.

Overall, 14 per cent of children under 2 years of age suffered from wasting, compared with 9 per cent of children 2–4 years.[8] While at the population level, the risk of wasting is highest among children under 2 years of age, research has shown that at the individual level, the risk of death associated with wasting is similar for children of all ages and for both girls and boys.[11] This means that once diagnosed with severe wasting, treatment is a must for every child, irrespective of age.

Relationship between stunting and age



EAP: East Asia and Pacific; ECA: Europe and Central Asia; ESA: Eastern and Southern Africa; LAC: Latin America and Caribbean; LIC: low-income country; LMIC: lower-middle-income country; MENA: Middle East and North Africa; SA: South Asia; UMIC: upper-middle-income country; WCA: West and Central Africa.

Child stunting is an indicator of sub-optimal physical and cognitive development, which also increases the risk of mortality, morbidity and impaired growth. The prevalence of child stunting increases rapidly in the first two years of life: our study found that the prevalence of stunting rises until approximately 28 months of age in all the world's regions. From that age onward, stunting prevalence first stabilizes and then falls slightly, probably due to catch-up growth and the less detrimental impact of infectious disease in children older than 2 years of age. The initial rise in stunting in the first two years is therefore likely due to the cumulative impact of undernutrition and infections in utero and during the first two years of life.

It is also clear that stunting and wasting are related to other deprivations. Inequities pertaining to poverty and inequality exacerbate the risk of stunting and wasting. Indeed, the highest prevalence of both stunting and wasting at any age is found among children from low-income households.

This finding tells us that, like child mortality, key nutritional risks – namely stunting and wasting – are concentrated in the first two years of life. When resources are limited, nutrition programmes can therefore maximize population level nutrition impact by prioritizing children under 2 years of age.

Finding 3. Inequities are preventing the children most at risk from accessing the nutritious diets and essential nutrition services they need to survive and thrive

Poor diets are a leading driver of malnutrition in children under 2 years of age. In our sample of 51 low- and middle-income countries we find that only 22 per cent of children aged 6–23 months are eating foods with the minimum dietary diversity needed for healthy growth and development.[12] The most vulnerable children – particularly from the poorest households and rural areas – are most likely to miss out on nutritious diets. Compared with those from the richest households, children from poor households are half as likely to be eating a minimally diverse diet. There are important urban and rural disparities in children's access to nutritious diets. Children from rural households are about half as likely to be fed the minimum dietary diversity as their urban counterparts.

Children under 2 years of age fare better in terms of consumption of vitamin A-rich foods. The research finds that 55 per cent of children 6–23 months of age had been fed such foods in the 24 hours prior to the survey. Further, about 60 per cent of children aged 6–23 months benefitted from vitamin A supplementation in the six months before the survey. However, life-saving vitamin A supplementation is out of reach for some of the poorest children, who have a 14 per cent lower likelihood of benefiting from vitamin A supplementation than children from richer households.

Our research shows that 22 per cent – just over one in five children aged 6–23 months – is missing out on both vitamin-A-rich foods and vitamin A supplementation, meaning they are experiencing multiple deprivations and are at greater risk of both early mortality and malnutrition. The proportion of children receiving neither vitamin A-rich foods nor vitamin A supplementation ranged from 10 per cent in East Asia and the Pacific, to 31 per cent in the Middle East and North Africa.Also here, we find significant inequities: in rural households, the share of children who have access to either vitamin-A-rich foods or vitamin A supplementation is 8 per cent lower than in children in urban households.[10]

These findings suggest that far too many children under 2 years of age are failing to receive the nutritious and diverse foods and essential nutrition services they need to survive, grow and develop to their full potential. The children at greatest risk are those who are missed with more than one preventative nutrition service or practice.

Programmatic implications: Improved child nutrition programmes to reach the youngest, the most vulnerable and the undernourished

There are several programmatic implications and opportunities arising from these research findings, which can guide improved programme design and implementation to reach the most vulnerable children with nutritious and diverse diets, essential services and positive feeding and care practices, to reduce mortality and nutritional risks.

The youngest children are most at risk of mortality and undernutrition

Our findings show that the first two years of life yield the greatest risk of stunting, wasting and death. This finding holds true across countries, among both boys and girls, and within households with the lowest and highest living standards. For nutrition programmes, these findings reinforce the continued importance of scaling up maternal and child nutrition interventions during the first 1,000 days, from pregnancy through the first two years of life.

Too many children under 2 years of age are missing out on the nutritious diets and essential nutrition services they need, during the time when it matters most

While children are most vulnerable before age 2, these first two years of life also offer the greatest opportunity to prevent malnutrition and boost child survival. The evidence is clear that nutrition interventions are most effective at preventing malnutrition during this critical developmental period but are insufficient in reach and often inequitable. Our research shows that far too many children under 2 years of age – one in five – are deprived of both nutritious diets and essential nutrition services, such as vitamin A supplementation. Maternal and child nutrition programmes must find better strategies for reaching children suffering from these multiple deprivations, who are great risk.

Prioritizing the youngest children is an effective strategy for optimizing reductions in malnutrition and mortality in contexts where resources are scarce, and data are limited

Ideally, early childhood nutrition programmes should aim to reach all children under 5 years of age with a package of evidence-based interventions to prevent malnutrition. However, when resources are scarce and data are limited, programmes can focus on preventing undernutrition and infections by scaling up coverage of proven nutrition interventions in children under 2 years of age to optimize impact in reducing stunting, wasting and mortality. Treatment for child wasting, however, should not be prioritized by age: all children under 5 diagnosed with severe wasting, no matter their age, must receive treatment and care.

While age is an important risk factor for undernutrition and mortality, it is not the only one

Our research clearly shows that children from poor and rural households continue to face inequalities in access to diets, services and practices that make them more vulnerable to malnutrition. Indeed, the highest prevalence of both stunting and wasting at any age is found among children from poorer households. This means that, in addition to prioritizing children under 2 years of age, programmers should also consider complementary factors that put children at risk according to context – such as poverty levels, disparities between young children living in rural and urban areas, exposure to conflict and other humanitarian crises, and other measures of disadvantage and vulnerability.

More and better data are needed to drive meaningful reductions in child mortality and malnutrition

Efforts to reach those children who are at higher risk of death and malnutrition is limited by the infrequency of quality data on nutritional status and mortality. However, multiple deprivations coincide and data on poverty, water and sanitation, and immunization status can guide the delivery of maternal and child nutrition programmes to high-risk communities and populations. In settings where such data are available to prioritize interventions towards low-income households, this remains an important and effective approach to reaching young children at high risk of malnutrition and death.

Our recommendations: Towards survival and optimal nutrition for every child

There is scope to improve the reach of nutrition interventions and services in the youngest children – those under 2 years of age – and thereby optimize survival, growth and development outcomes for the greatest number of children. This is particularly important when resources are limited. The following recommendations outline considerations for such contexts.

1. As a first step, programmes should conduct a comprehensive review of their coverage and equity. Where there is scope to reach more children under 2 years of age, explicit prioritization of this age-group should be considered, regardless of coverage in children between 2 and 5 years.
2. A decision to prioritize children under 2 years of age should be followed by an appraisal of opportunities to optimize reach in this age group. Such opportunities may be in both programme design and implementation; for example, integration with other programmes already targeting the youngest children (e.g., routine immunization); training of community-based health and nutrition workers on the benefits of prioritizing children under 2 years of age; oversupply of essential nutrition commodities for the youngest age-group to avoid stock-outs; and social mobilization to target communication, counselling and support to caregivers with children under 2 years of age.
3. If not already available, age-disaggregated coverage data collection should be introduced into administrative data systems, with an aim to have coverage estimates for children under 2 years and children 2–5 years of age, to enable programmers to track progress.
4. Where resources are limited and a decision is made to prioritize, programmes may consider a phased approach, whereby some areas (e.g., districts) focus on children under 2 years of age, while other areas maintain a focus on children under 5 years of age, with subsequent comparison. If the programmatic change to prioritize the youngest children pays off (for example in the form of increased coverage and reductions in child mortality, morbidity and malnutrition), the change can be rolled out to all areas.
5. Programmes should document and evaluate the policies and programmes aimed at prioritizing children under 2 years of age, in order to enable adjustments and optimize nutrition impact on child survival, growth and development.

Endnotes

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